

207  
/AN ANALYSIS OF CALVING SEASON  
STRATEGIES/

by

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## CHAPTER I

### INTRODUCTION

The beef industry is the single largest segment of the Kansas agricultural economy, comprising 51.9 percent of the total value of production in 1984. Since 1930, cattle have averaged over 40 percent of the total value of agricultural production while wheat, the second largest, has averaged just over 27 percent.<sup>1</sup>

The beef cowherd is an integral component of this industry with Kansas annual cow numbers ranging between 1.5 to 2 million head, the last twenty years, according to USDA cattle inventory data. Beef cows are well adapted to the Kansas plains because they can effectively utilize the large supply of forage and range that is available. Total range area in Kansas is estimated to be 18,975,000 acres. Of this total, 16,272,000 is native grass species, including tall and shortgrass rangelands while the other 2,703,000 acres is made up of introduced forage species.<sup>2</sup> Nearly four million acres of this range area is located in a 12 county  
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<sup>1</sup>Robert L. Vossen, Kansas Department of Agriculture, USDA, ERS, Topeka, Kansas, 4 December 1985.

<sup>2</sup>U.S. Department of Agriculture, Soil Conservation Service, "Soil and Water Resources Conservation Act", Washington D.C. (1979).

helt in eastern Kansas, bounded on the north by Riley and Pottawatomie counties and on the south by Cowley and Chautauqua counties. This area, known as the Flint Hills, alone can provide forage for up to 500,000 beef cows. Another potentially large forage source is the crop aftermath that results from the 30.6 million acres of cropland in Kansas. Although often of low quality this forage can effectively provide adequate nutrition to breeding herds during certain stages of production.

Cowherd profitability has always been cyclical in nature. During the early 1970s when interest rates, fuel costs and other factors of production started to rise many ranchers were kept afloat because of the increased value of their land due to high inflation. Today, while interest rates and other costs of production are still relatively high, inflation has cooled considerably and the beef industry is currently caught in a severe cost/price squeeze. Now, more than ever, cattlemen must cut costs and determine the most profitable methods of production. An important factor that should be addressed is time of calving. The calving season has impact throughout the year, from changing the amount of feed required to maintain the beef cow to influencing the prices producers receive for their calves. In addition, because of the difficulties and costs involved in significantly changing the time when a beef cow calves, the calving season decision not only impacts the profitability of the cattle operation in the shortrun but in the longrun as well.

The most significant impact of calving season on production costs occurs as a result of the differing amounts and qualities of feed that a beef cow needs depending upon her specific stage



of production.<sup>3</sup> Figure 1 shows the average monthly total digestible nutrient (TDN) requirements of an 1100 lb beef cow, calving both during the fall and spring and the pounds of TDN provided by native bluestem range. Matching those stages of production where the beef cows needs are highest with those times when range quality is at its highest, for example, by calving in spring, a producer could lower his yearly feed bill.

A study is needed that can provide data about the effects of calving season on supplemental feed requirements. Producers and ag specialists face numerous uncertainties when considering the merits of a particular calving season and objective information about the differing amounts of supplemental feed is necessary to aid them in the decision making process.

Due to the high degree of seasonality in cattle prices, calving season can also impact profitability by influencing when cattle are ready for sale. Many Kansas cattlemen calve their herds in spring, in order to lower their winter feed bill.

<sup>3</sup>The following discussion of the feed requirements of beef cattle was derived from "Cow Herd Nutrition", a KSU extension bulletin by Larry Corah. Generally, the 365-day cow year is split into four distinct periods, each with a unique set of nutritional requirements necessary to meet the particular needs of the cow. Period 1 is the 90 days following calving when the cow is lactating at her highest level while trying to maintain maximum calf growth. In addition, during this period the cow must undergo uterine involution, start recycling and rebreed. This is clearly the most important nutritional period. Period 2 occurs during the following 120 days when the beef cow is in the early stages of pregnancy while still lactating and maintaining a calf. The third period lasts for 90 days and is called midgestation, during this time the cow must primarily maintain her developing fetus. It should be noted that this period is where the beef cows nutritional needs are at their lowest level of the year and is a time where low quality forages work extremely well in beef cow rations. Period 4 is the second most important period in the beef cow year. During this 60 day period 70% to 80% of the total fetal growth occurs and the cow must also prepare for lactation.

Figure 2 shows that if a cattleman wishes to wean and sell his calves at seven months of age he will sell in the fall, on average encountering the lowest seasonal prices of the year. Clearly, there is reason to analyze calving season and its effects on calf prices and cowherd profitability. To be useful, the analysis of calf prices should focus not only on seasonal indices, but also on the price changes between incrementally larger calf weights. This would better reflect the price relationships faced by producers who consider retaining ownership of their calves after weaning.

It is generally estimated that fifteen to thirty percent of Kansas cowherds calve in the fall with the balance calving primarily in the spring months of February through May. The question of whether to calve in the spring, the fall or a combination of the two has often been asked, but has never been adequately answered. Many of the advantages or disadvantages of one calving season as compared to another or a combination of the two are often subjective and uniquely related to the individual cattle operation. Factors such as the timing of labor use, for example, depend on what other enterprises are employed. While it is an advantage to breed cattle on grass where the natural flushing effect of lush spring grass improves conception rates, it also makes artificial insemination (AI) more difficult and time consuming since the cattle are scattered across summer pastures. On the other hand, while it is easier to use AI in fall calving herds when cattle are closer at hand for feeding, the winter cold decreases conception rates.

Figure 1.

# **TDN: COW REQ'S VS. RANGE AMOUNT** FOR BOTH FALL & SPRING CALVING

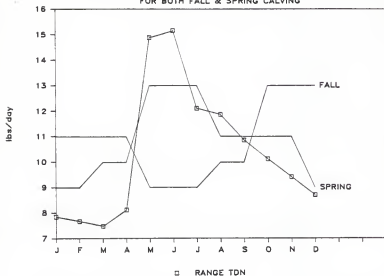
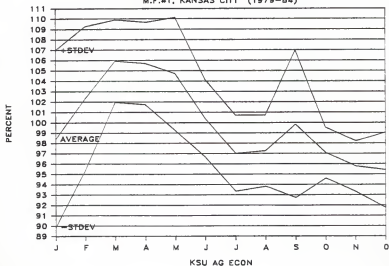


Figure 2.

# **4-5 CWT FEEDER STEER SEASONAL INDEX** M.F.#1, KANSAS CITY (1979-84)



In summary, producer decisions on calving season are all too often affected by factors that are subjective in nature and not based on costs of production and revenue generated. Today, with many cow-calf operators financially squeezed, it is more important than ever to conduct an analysis of calving season based solely on costs incurred and income received. This type of analysis could provide producers and ag advisors useful, objective information when selecting a calving season for a particular operation. The analysis should concentrate on 1) feed costs, since they are the single largest cost component and 2) calf prices, because they are the major source of revenue. This does not imply that other factors are not important, but that other factors should not be considered until first, the individual knows the implications that calving season has on costs and returns, and second the individual knows what resources are available and what enterprise combinations will be employed on their particular operation.

The results of this study, while not answering the question of which calving season is best for an individual operation, should provide important data on the relative costs and price relationships that are involved. These relative costs and price relationships can be used by cattlemen and ag advisors to determine what some of the more subjective reasons for a particular calving season actually cost. Producers should combine the results of this study with other factors, such as resources available and competing enterprises employed, when making the decision of calving season for their particular cattle operation.

## CHAPTER II

### LITERATURE REVIEW

Evaluation of cost-price relationships between calving seasons is an area where little research has been concentrated. Agricultural research of calving season has, in the past, primarily focussed on production. Today, with many cattlemen feeling the pinch of a severe cost-price squeeze, it is important to analyze how input and cattle prices affect the profitability of differing calving periods.

An extensive computer search was conducted through Farrell Library at Kansas State University to obtain sources for a review of literature. The file searched was Cain and the search term, calving season, was coded into the computer to aid in the process. In addition, the following indices were also examined for data references pertaining to calving season: The Reader's Guide to Periodical Literature, Biological and Agricultural Index and the Bibliography of Agriculture. Several articles and research papers were found, but few concentrated on cost and or price relationships.

Marketing is a key element in a cow-calf operation. Selling calves when prices are seasonally high and buying supplemental feedstuffs when feed prices are low can often spell the

difference between profits and losses. A system of analyzing costs of production and calf prices at each phase of calf production (weaning, backgrounding, grazing, etc.) was used by Pretzer (1984).<sup>1</sup> The system examined spring calving cowherd profits by subtracting accumulated cowherd costs from calf revenue, as generated by existing calf prices at sale time and calf weight. Data on profitability was calculated for each production stage up to and including the finishing stage. This approach will be utilized as a method of organizing the applicable production options faced by each calving period and comparing the different calving season management strategies.

Smith (1982), developed a systematic method for selecting profitable combinations of forages, land and cattle types.<sup>2</sup> The research did not evaluate calving season, but did study the seasonal price changes that occurred as a feeder calf was grazed. This concept will be used to analyze the profitability of the production options from weaning to retained ownership that are applicable to each individual calving period. The decision of when to sell a calf depends not only on the costs currently invested, but also on the expectations of future price direction. A study is needed that looks at seasonal price changes and how they affect different calving seasons. The results can then be used to aid producers and ag specialists when 1) choosing a  
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<sup>1</sup>Don D. Pretzer, "Beef Programs for Profit" (Dillon, Colorado:Great Plains and Western Outlook, July 24-26, 1984).

<sup>2</sup>D. Smith, "An Analysis of Beef-forage Grazing Systems"(MS. thesis, Kansas State University, 1982).

particular calving season and 2) when making the sell at weaning or retain ownership to sell later decision.

Comparisons of the cost-price relationships involved in calving season call for an analysis based on sound production data. It is in this area that most research regarding calving season has taken place. Production data that examines how feed and forage resources are utilized by beef cowherds is important to this analysis, since consumption and production data must be calculated and held constant among calving seasons to better study cost-price effects. A method of determining the amount of range supplementation necessary for a beef cow based on her particular stage of production and the nutritional value of the range was used at Kansas State University by Corah and Smith (1978).<sup>3</sup> This method subtracted the nutrient requirements of the beef cow from the nutritional value of the range. Nutritional deficits were then made up by the least cost feed supplement available. The approach allows rations to be derived regardless of the cows stage of production or time of calving and will be the method used in this thesis.

Some production data uncovered in the literature review dealt with comparisons of fall vs. spring calving, and can be used as parameters in the development of cowherd budgets. For example, Kartchner et al., found that forage consumption of fall calving cow-calf pairs averaged 26% over that of spring pairs. This information is useful when calculating the additional feed -----

<sup>3</sup>Larry Corah and Ed Smith, "Feed Supplements for Maximum Use of Native Range" (Manhattan Kansas: Cooperative Extension Service, L-517 [1978]).

supplementation necessary for spring and fall calving cowherds. In addition, research by Nelsen et al. (1982) and Chestnutt (1982) emphasized the importance of sound nutritional programs for both spring and fall calving herds.

The literature cited in the bibliography indicates the relatively large amount of information pertaining to both, beef cattle production and the effects of calving season on beef cattle production, and legitimizes the coefficients used in this thesis. This production data however, while important, is not directly relevant to the objectives of this thesis and will not be discussed further in this review.



## CHAPTER III

### METHODOLOGY

The objective of this thesis is to evaluate the impacts of calving season on cowherd profitability. The analysis will concentrate on; 1) cow unit feed costs, since they are the single largest cost component, 2) calf prices, because they are the major source of revenue and 3) retained ownership strategies, which are an accepted method of increasing cowherd profits or decreasing cowherd losses.

Traditionally, farmers and ag specialists have used the budgeting technique as a method of selecting the most profitable plan from among a number of alternatives and of testing the profitability of any proposed change in a plan. Budgeting involves testing plans on paper before implementing it to be sure it will improve profit. There are several types of budgeting, each of which is adapted to a particular size and type of planning problem. Whole farm planning and budgeting and cash flow budgeting involve plans for the entire farm or ranch business. Enterprise budgeting and partial budgeting are

related, as they are used to analyze only a part of the overall business or a small change in the whole farm plan.<sup>1</sup>

This thesis, for evaluating the effects of calving season on annual beef cowherd cost-returns, relies on the enterprise budgeting technique as the primary analytical tool. An enterprise budget is a listing of all estimated income and expenses associated with a specific enterprise to provide an estimate of its profitability.<sup>2</sup> Enterprise budgets can be developed for each actual or potential enterprise in a farm plan such as the corn, wheat or cow-calf enterprises. Each is developed on the basis of a small common unit such as one acre for crops or one head for livestock. This permits easier comparison of the profit for alternative and competing enterprises.

An enterprise budget for beef cowherds will be developed utilizing the Lotus 123 electronic spreadsheet software program on a Zenith Z-150 microcomputer. Eight different cowherd calving season management options (enterprises) will be analyzed. Six of the options are based on year round native range. The eight options are shown on the beef cowherd cost-return budget, Table 1. The management options are classified into four sixty day calving periods, two each in the spring, February-March and April-May, and two in the fall, September-October and November-December. The two fall calving periods are further analyzed by dividing them into weaning at seven months of age or nine months,

<sup>1</sup>Ronald D. Kay, Farm Management: Planning, Control, and Implementation, (New York: McGraw-Hill, 1981) pp.60-61.

<sup>2</sup>Ibid.

TABLE 1.—Sample beef cowherd cost-return budget

1984

### COSTS ###	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
I. TOTAL VARIABLE COSTS									
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$108.80	\$108.80	\$121.60	\$121.60	\$121.60	\$121.60	\$83.20	\$83.20
b. Fescue Pasture (rent & fert./AC)		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$71.67	\$71.67
c. Alfalfa Hay		\$59.87	\$37.69	\$75.39	\$57.48	\$75.39	\$57.48	\$13.75	\$16.66
d. SBM 44%		\$0.00	\$0.00	\$0.00	\$8.85	\$0.00	\$8.85	\$0.00	\$0.00
e. Mineral & Salt		\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32
f. Grass		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
g. Grass Hay		\$9.72	\$9.72	\$18.96	\$18.96	\$18.96	\$18.96	\$7.21	\$7.90
Total Cow Unit Feed Costs		\$181.72	\$159.53	\$211.27	\$200.21	\$211.27	\$200.21	\$179.16	\$182.76
2. Bull & Replace. Feed Costs/C-c unit		\$52.58	\$52.58	\$52.58	\$52.58	\$52.58	\$52.58	\$52.58	\$52.58
Total Feed Costs		\$234.30	\$212.11	\$263.86	\$254.79	\$263.86	\$254.79	\$231.74	\$235.34
B. Labor		\$25.20	\$25.20	\$33.60	\$33.60	\$33.60	\$33.60	\$33.60	\$33.60
C. Other Variable Costs (Held Constant)		\$55.85	\$55.85	\$55.85	\$55.85	\$55.85	\$55.85	\$55.85	\$55.85
D. Interest (= Half of VC x int. rate)		\$22.86	\$21.25	\$25.61	\$24.96	\$25.61	\$24.96	\$23.29	\$23.55
TOTAL VARIABLE COSTS		\$336.21	\$314.41	\$378.92	\$369.20	\$378.92	\$369.20	\$344.48	\$348.34
II. TOTAL FIXED COSTS (Held Constant)		\$167.02	\$167.02	\$167.02	\$167.02	\$167.02	\$167.02	\$167.02	\$167.02
III. TOTAL COSTS (TVC+TFC)		\$503.23	\$481.44	\$545.94	\$536.22	\$545.94	\$536.22	\$511.50	\$515.36
### RETURNS ###									
	BORN : WEANED:	FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
A. Steer Wean Weight		550	483	578	546	464	481	578	546
B. Heifer Wean Weight		521	380	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	585	477	486	428	585	477
II. PRICES									
A. Steer Price/Cwt at Weaning		\$66.31	\$68.18	\$66.03	\$64.99	\$71.11	\$66.21	\$66.03	\$64.99
B. Heifer Price/Cwt at Weaning		\$57.00	\$56.52	\$55.50	\$57.17	\$59.31	\$55.68	\$55.50	\$57.17
C. Cull Cow Price/Cwt		\$36.73	\$36.73	\$41.78	\$38.51	\$44.64	\$39.65	\$41.78	\$38.51
III. REVENUE									
A. Steer Revenue (\$)		\$164.12	\$123.64	\$171.74	\$159.68	\$146.48	\$143.31	\$171.74	\$159.68
B. Heifer Revenue (\$)		\$89.89	\$64.43	\$98.74	\$88.33	\$77.93	\$75.56	\$98.74	\$88.33
C. Cull Cow Revenue (\$)		\$68.60	\$68.60	\$68.94	\$63.54	\$73.66	\$65.42	\$68.94	\$63.54
TOTAL REVENUE		\$313.61	\$256.68	\$339.42	\$311.55	\$298.07	\$284.29	\$339.42	\$311.55
### ANALYSIS ###									
I. REVENUE-VARIABLE COSTS		(\$24.48)	(\$65.73)	(\$47.50)	(\$57.65)	(\$78.85)	(\$84.91)	(\$13.05)	(\$36.79)
II. REVENUE-TOTAL COST		(\$191.42)	(\$232.76)	(\$214.52)	(\$224.67)	(\$245.88)	(\$251.93)	(\$180.08)	(\$203.81)
III. CALF BREAK-EVEN PRICE (Variable Costs)		\$57.68	\$72.03	\$61.34	\$64.82	\$75.21	\$72.28	\$54.52	\$59.65
IV. CALF BREAK-EVEN PRICE (Total Costs)		\$92.26	\$119.44	\$94.39	\$99.00	\$116.36	\$112.02	\$87.58	\$94.63
V. INVESTMENT*		\$4,247	\$4,236	\$4,639	\$4,634	\$4,639	\$4,634	\$4,357	\$4,359
ASSET TURNOVER :									
VI. NET (Ln. II.) / INVESTMENT (Ln. V.)		-2.29%	-3.27%	-2.68%	-2.82%	-3.27%	-3.41%	-1.97%	-2.52%
VII. GROSS (Tot. Rev.) / INVESTMENT (Ln. V.)		9.68%	8.09%	9.17%	8.75%	8.58%	8.17%	9.77%	9.31%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

TABLE 1.—Continued. Sample beef cowherd cost-return budget

1984

** FACTORS THAT VARY BY CALVING SEASON **		SPRING		FALL		FALL		FALL FESCUE	
UNIT	PRICE	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
))))))))))))))))))==(Accounts are units per head per year)									
I. COW UNIT FEED COSTS									
A. Native Range AC	\$12.00	8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5
B. Fescue Pasture** AC	\$23.64	8.0	8.0	8.0	8.0	8.0	8.0	1.5	1.5
C. Alfalfa Hay TONS	\$71.00	0.84	0.53	1.06	0.81	1.06	0.81	0.19	0.23
D. SBM 44% TONS	\$300.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00
E. Mineral & Salt CWT	\$5.83	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain BU	\$2.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Grass Hay TONS	\$52.00	0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert. AC	\$24.14	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$36.21	\$36.21
II. LABOR	\$4.20	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
III. REVENUE FACTORS	BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DE	SEP-OCT	NOV-DEC
	WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer Price/Cwt at Weaning		\$66.31	\$68.18	\$66.83	\$64.99	\$71.11	\$66.21	\$66.83	\$64.99
B. Steer Weight		550	483	578	546	464	481	578	546
C. Heifer Price/Cwt at Weaning		\$57.00	\$56.52	\$55.58	\$57.17	\$59.31	\$55.68	\$55.58	\$57.17
D. Heifer Weight		521	388	545	515	438	453	545	515
E. Days of Age at Sale		245	184	273	274	212	227	273	274
F. Cull Cow Price/Cwt.		\$36.73	\$36.73	\$41.78	\$38.51	\$44.64	\$39.65	\$41.78	\$38.51
** FACTORS HELD CONSTANT BY CALVING SEASON **				VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) **					
I. OTHER VARIABLE COSTS				A. % Calf Crop					
A. Utilities, Fuel & Oil				B. % Steers Weaned for Sale					
B. Vet. & Drugs				C. % Heifers Weaned for Sale					
C. Marketing & Breeding				D. % Heifers Weaned for Herd Replacement					
D. Repairs, Tools & Supplies				E. % Bull per Cow					
E. Auto Expense				F. Average Cow Value					
F. Misc.				G. Average Bull Value					
G. Implants				H. Cow Life					
II. BUILDINGS & EQUIPMENT				I. Bull Life					
A. Investment				J. Salvage Value/Cow					
B. Life				K. Salvage Value/Bull					
C. % Tax & Insurance for Bldg/Exp, Livstck				L. Cull Cow Weight					
III. INTEREST RATES				** The values in section VI. BREEDING HERD, are					
A. Operating Rate----- (%)				generally regarded as industry averages and are held					
B. Fixed Funds Rate----- (%)				constant throughout the analysis. Bull and cow values					
IV. NATIVE RANGE VALUE/ACRE				are estimates which are consistent with Kansas State					
V. FESCUE PASTURE VALUE/ACRE				University Farm Management Guide (MF-266)					

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf Lbs Produced/Cow: assuming a 98% calf crop = (42% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 38% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced

and then evaluating them with winter fescue pasture, to study how differences in range resources affect profitability.

The budgeting process is a simplified representation of reality and will only address the major variables. In this thesis, cow unit feed costs and calf revenue are the major variables to be analyzed. All other variables will be held constant or held in constant proportion among all calving seasons, with only prices changing from year to year.<sup>3</sup> This allows the analysis to better reflect the differences in calving season due only to cow unit feed costs and calf revenue. A sample beef cowherd cost-return budget is located in Table 1, which provides an overall view of the budget variables and how they are utilized in this analysis. A more detailed explanation of the variables and how they are used can be found in Appendices 1-5.

Early spring calving is generally recognized to be the typical calving period in Kansas and thus was used as the control group in this study. The beef cowherd cost-return budget, by evaluating eight different calving season management strategies, allows comparisons between several management options.

- 1) Spring vs. Fall Calving
- 2) Early vs. Late Spring calving
- 3) Early vs. Late Fall calving
- 4) Weaning Fall calves at 7 mos. of age or 9 mos.
- 5) Fall calving: all native range vs. supplemental fescue

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<sup>3</sup>It is important to note that the cost and price relationships present in any given year may or may not be typical of the norm. It is for this reason that the analysis will be conducted for each of the ten years 1975 through 1984. (see appendix 1) Conclusions can then be drawn from price relationships averaged over a ten year period and not from relationships of a single year.

The nutritional requirements and performance of asinulated 1100 pound black haldy cow and her exotic sired calf will be used in all budgets to prevent genetic differences in cattle from skewing the results. Calves were assumed born in the middle of each calving season, for example, on March 1, May 1, October 1 and December 1.

#### BEEF COWHERD COST-RETURN BUDGET

The beef cowherd cost-return budget is made up of three sections; costs, returns and analysis. Costs are divided into two parts, fixed and variable. Total fixed costs are calculated for each year and held constant among all calving season management options. A summary of the methods used to derive fixed costs are included in Appendix 2, Fixed Costs for the Beef Cowherd.

##### Costs

The primary emphasis in the cost section of the budget is to evaluate differences between calving seasons due to the additional feed necessary to supplement the range. For this reason the variable cost section is split into three divisions, total feed costs, labor and other variable costs. Cow unit feed costs were the major feed cost component and derived by applying selected feed prices to the amounts used in the rations of each calving system. A complete description of the feed prices used can be found in Appendix 3, Inputs for Beef Cowherd Cost-return Budgets.

The rations for each calving season management strategy were calculated with the assistance of Dr.'s Larry Corah and Frank Brazle, extension livestock specialists Kansas State University, and held constant throughout the analysis. The process consisted

of subtracting the amount of nutrients provided by the range from<sup>17</sup> the amount of nutrients required by the cow based upon her specific stage of production. Any ration deficiencies were met by the least cost combination of supplemental feedstuffs. A summary of the quantities of supplemental feed/month in each cowherd ration is in Table 2. Possible ration components included native range, fescue pasture, alfalfa and grass hay and soybean meal. Extra grass hay in the budget represents forage needed to replace range due to snow cover. A detailed explanation of the procedures used and the assumptions made can be found in Appendix 4, Beef Cowherd Rations.

Bull and replacement heifer feed costs, the second feed cost component, is calculated each year and held constant among all calving season management options. By including these costs and holding them constant the analysis could better reflect the differences in calving season due only to cow unit feed costs and still retain the realism of a complete cost-return budget. Appendix 4 contains the rations used in the calculation of this budget input.

The cost of labor is another variable cost, it is made up of a wage rate (see appendix 3) and hours of labor required by the particular calving season. Labor hours/calving season is an area where there is very little reliable data. Conversations with animal scientists and agricultural economists from Missouri and Kansas revealed that estimates of labor hours/calving season ranged from 7 - 9 hours for fall calving and 5.5 - 8 hours for

TABLE 2.--Beef cowherd ration Summary

----- Year Round Native Range -----						
part A		SPRING CALVING		FALL CALVING		FALL FESCUE *
Months	Calving	(FB-MR)	(AP-MY)	(SP-OC)	(NV-DC)	(SP-OC) (NV-DC)
Native Range	AC	8.0	8.0	9.5	9.5	6.5 6.5
Fescue	AC	0.0	0.0	0.0	0.0	1.5 1.5

part B ALFALFA NEEDS: LBS/MONTH (dry matter basis)						
JAN	244.7	200.4	296.5	274.6 **	99.7	139.5
FEB	291.0	181.0	267.8	248.0 **	112.0	140.0
MAR	381.5	202.7	213.7	213.7	108.5	108.5
APR	333.7	160.6	166.3	166.3	0.0	0.0
MAY	0.0	0.0	0.0	0.0	0.0	0.0
JUN	0.0	0.0	0.0	0.0	0.0	0.0
JUL	0.0	0.0	0.0	0.0	0.0	0.0
AUG	0.0	0.0	0.0	0.0	0.0	0.0
SEP	0.0	0.0	0.0	0.0	0.0	0.0
OCT	0.0	0.0	217.0	0.0	0.0	0.0
NOV	0.0	0.0	268.9	118.9	0.0	0.0
DEC	115.1	115.1	290.1	290.1	0.0	0.0
TOTAL	1366.1	859.8	1720.2	1311.5	320.2	388.0
AS FED	1517.8	955.4	1911.4	1457.2	352.2	426.8
10% WASTAGE	1686.5	1061.5	2123.8	1619.2	387.4	469.5

part C  
Pounds of grass hay needed in winter

Grass hay needed to replace range due to snow is based on the average number of days with 1" of snow cover or more on the ground. A thirty year average was provided by Dean Bark, Climatologist Ag Exp. Station

	Native Range (Manhattan)		Fescue (SE. KS.)		
	snow days		snow days		
	1"or more	SPRING	FALL 1"or more	(SP-OC)	(NV-DC)
December	5	76.0	85.5	2	50.0 50.0
January	6	81.6	91.8	4	73.2 83.6
February	6	79.8	90.0	4	70.0 81.6
March	5	71.5	81.0	2	36.0 36.0
TOTAL	22	308.9	348.3	12	229.2 251.2
AS FED		339.8	383.1		252.1 276.3
10% WASTAGE		373.8	421.4		277.3 304.0

\* In the fall fescue pasture option, cows are on fescue from October 1 to April 30, and then on native range from May 1 to September 30. Fall fescue was fertilized each year at the rate of 60-30-30 (lbs NPK).

\*\* In the native range late fall calving option (Nov-Dec), 31 lbs of soybean meal was fed in the month of January and 28 lbs in February.



spring.<sup>4</sup> From those ranges, 6 hours for spring calving and 8 hours for fall calving were selected.

Other variable costs, are factors seen as being minutely affected by calving season and thus are held constant to allow the hudget to better reflect differences in profitability due only to cow unit feed costs and calf revenue. These factors were largely derived from Kansas Farm Management Association records.<sup>5</sup> A listing of the individual variables are located on the second page of Table 1 and a detailed explanation of each is provided in Appendix 3.

The operating interest rates used were provided by the Manhattan Production Credit Association and were reflective of the average annual interest rates charged for short term operating loans.<sup>6</sup>

#### Returns

The second major section of the hudget deals with returns. The gross returns to any cow-calf operation are dependent on two variables, the pounds of beef produced and the price received for the pounds produced. Cattle prices used represent average prices at sale time of Kansas City choice medium framed feeder calves  
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<sup>4</sup>Based on conversations with Don Pretzer, Mike Sands and Larry Corah, Kansas State University and Victor Jacobs, University of Missouri, Columbia, 1985.

<sup>5</sup>Kansas Cooperative Extension Service, Department of Economics, Kansas Farm Management Handbook, Kansas State University, Manhattan.

<sup>6</sup>A fixed funds interest rate was also included in the hudget to represent the average annual interest rate charged on long term loans, primarily land. This was based on rates provided by the Manhattan Federal Land Bank. Both rates are detailed in Appendix 3.

and utility yield grade 2-3 cows. Weaning calf weights were based on conversations with Kansas State University Animal Scientists and will be held constant for each year of the study. A more detailed explanation of the prices and calf weights used in the heifer cowherd cost-return portion of this thesis are summarized in Appendix 5, Cow and Weaning Calf Revenue Factors.

### Analysis

The final section of the heifer cowherd cost-return budget is labelled analysis and is made up of key cowherd profitability measures. These measures include calculations of revenue minus variable costs, revenue minus total costs, investment, asset turnover and calculations of breakeven prices.

Revenue minus total costs, is a measure that represents the returns a producer receives after paying for all of his factors of production. It reflects the total return to his management and investment, and is an indicator of long run profitability.

Revenue minus variable costs, is a proxy measure of the returns a producer receives after paying all of his "out-of-pocket" costs. This measure does not include fixed costs, which are generally seen as sunk for the producer presently operating. Negative values here indicate severe shortrun profitability problems.

Calf breakeven prices, are calculated to give an indication of the weighted average prices for both steers and heifers that a producer would need in order to exactly pay all of his variable or total costs.

Investment is a measure of the total capital necessary per cow unit to operate a cow-calf farm or ranch.

There are two calculations of asset turnover used in the beef cowherd cost-return budget. Net turnover measures revenue minus total costs as a percent of investment. This can be viewed as a proxy for the opportunity costs of farming as compared to investing a like amount of money at the market rate of interest. Gross turnover is total revenue as a percent of investment. This ratio can also be viewed inversely as the dollars of investment necessary to generate a dollar of gross revenue.

As stated earlier the goal, of this thesis, is to evaluate the impacts of calving season on cowherd profitability. For the typical feeder calf producer, overall cowherd profitability is a function of many variables. This thesis concentrates primarily on two variables; cow feed costs and beef cattle prices. All other factors of production will be held constant. The intent is not to claim that one calving season is always better than another but to determine why in this instance one was relatively more profitable. The goal is to evaluate the relationships of key variables and how they affect cowherd profits. From this evaluation, conclusions can be made about these variable relationships which can be used by ag specialists and producers in analyses of individual operations.

Beef cowherd cost-return budgets will utilize representative prices for each year from 1975 through 1984. From this body of data, tables consisting of key budget variables representing all of the calving season management options for each of the ten years of this study will be presented. These can be found in Appendix 6. Among the budget variables to be analyzed are: cow unit feed costs, beef cattle prices, total revenue and each of the

variables in the analysis section of the beef cowherd cost-return budget.

Because the relative levels of prices change from year to year, absolute values can often lose their significance. For example, a \$7 difference between \$2 and \$9 is quite large, while a \$7 difference between \$102 and \$109 is relatively less significant. An additional measure is needed to better analyze the relationships of budget variables between differing calving seasons. Early spring (Feb-Mar) will be used as the basis of comparison. Budget variables of each calving season option divided by the value of the Feb-Mar calving period allows the relationships between variables to be evaluated on a percentage basis, unaffected by year to year changes in the relative price level.

#### Statistical Measures

To analyze relationships among variables it is important to know the average value that would be expected in any given year and also the degree of variability around that average value. Reliable conclusions cannot be drawn unless one can be reasonably certain that variable relationships will fall within a relatively small range around the expected value. In this thesis, two statistical measures will be utilized when analyzing budget variables. The sample arithmetic mean,  $\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$ , is used to estimate the average of budget variables over the ten year period of the study.<sup>7</sup> While the sample standard deviation,

<sup>7</sup> X, n and i are statistical terms which are defined here. X = sample observation, n = size of sample, and i represents the ith number of the sample.

$S = \sqrt{\sum_{i=1}^n x_i^2 / (n-1)}$ , is used to measure the variation among the yearly values of budget variables. A normal distribution of budget values around the mean,  $\bar{X}$ , will be assumed. Certain statistical conclusions about the distribution of budget variables around the average can then be stated.

In any normal curve, over two thirds of the measurements lie in the interval,  $\pm$  one standard deviation (STDEV) around the average, while some 95% are in the interval,  $\pm$  two STDEV's. Only 26% of the total frequency lies beyond  $\pm$  three STDEV.<sup>8</sup>

Thus, in this thesis values are calculated for a  $\pm$  one STDEV around the average to give an indication of the range in which budget variables would fall two thirds of the time.

#### RETAINED OWNERSHIP ANALYSIS

Retained ownership of calves after weaning is often seen as a strategy that can increase cowherd profits. Depending on weaning time, this strategy can involve programs ranging from drylot backgrounding to full or intensive grazing of native range. Retained ownership lengthens the time period in which a particular calf crop can be marketed and thus increases the chances of a producer receiving calf prices necessary to earn a sufficient return over costs.

Backgrounding and grazing retained ownership options will be analyzed for each calving period.<sup>9</sup> The complete programs for each calving season are outlined in Table 3.

<sup>8</sup>George E. Snedecor and William Cochran, Statistical Methods, (Ames: Iowa State University Press, 1980) p. 39.

<sup>9</sup>Retained ownership of steers was the only production option analyzed. This would be the equivalent to selling your heifers at weaning and replacing them with steers.

For purposes of comparison, each calving season management program is evaluated at a point when the calf weighed 750 lbs, which is a typical weight for feeder cattle to enter the feedlot. This allowed each strategy to be compared on the basis of costs and prices incurred in growing a calf to the same production phase. Returns minus variable costs (ret-vc) for each retained ownership option are added to the ret-vc for each appropriate calving season option to illustrate the changes in profits due to lengthening the ownership period. A more detailed explanation of the retained ownership budgets can be found in Appendix 7.

TABLE 3.--Calving season management programs with retained ownership

Calving Season	Date Weaned/ Age at Weaning	Retained Ownership Programs	In/Out Dates
1)Feb/Mar	Nov 1/ 8 mos.	A)BKG* @ 2.25 ADG* B)BKG @ 1.25 ADG (1)Full Graze (2)Int. Graze	Nov 1/May 1 Nov 1/May 1 May 1/Oct 1 May 1/Jul 15
2)Apr-May	Nov 1/ 6 mos.	A)BKG @ 2.25 ADG B)BKG @ 1.25 ADG (1)Full Graze (2)Int. Graze	Nov 1/May 1 Nov 1/May 1 May 1/Oct 1 May 1/Jul 15
3)Sep-Oct	May 1/ 7 mos.	A)Full Graze B)Int. Graze (1)BKG @ 2.25 ADG	May 1/Oct 1 May 1/Jul 15 Jul 15/Sep 23
4)Sep-Oct	Jul 1/ 9 mos.	A)BKG @ 2.25 ADG	Jul 1/Sep 15
5)Nov-Dec	Jul 15/ 7.5 mos.	A)BKG @ 2.25 ADG	Jul 15/Nov 13
6)Nov-Dec	Sep 1/ 9 mos.	A)BKG @ 2.25 ADG	Sep 1/Dec 1

\*BKG = Drylot Backgrounding

ADG = Average Daily Gains (lbs)

## CHAPTER IV

### RESULTS

This chapter is a summary of the major points and primary conclusions drawn from this analysis. The first section examines the relative profitability of the various calving season management strategies, then certain key budget variables were evaluated to measure their impacts on cowherd profitability. Next, some of the individual management strategies were compared and finally, retained ownership was brought into the analysis to measure its effects.

#### PROFITABILITY

Just as profits are the key to survival in any agricultural operation, revenue minus variable and total costs were the determining factors in judging one calving season management option over another in this study.<sup>1</sup> Table 4 shows that, given a resource base of year round native range, early spring calving (February-March) was the most profitable calving period. Early spring was the only period to average positive returns over variable costs (ret-vc), for the ten years of this analysis.

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<sup>1</sup>Returns minus total costs were not covered in depth since fixed costs were held constant among all calving seasons for each year of the analysis.

TABLE 4.--Calving season cowherd profits

Calving Season	Age at Weaning	Average Ret-VC	Standard Deviations Around the Mean	
			+1 STDEV	-1 STDEV
1)Feb-Mar	8 mos.	\$6.80	\$77.21	(\$63.62)
2)Sep-Oct	9 mos.	(\$6.15)	\$64.81	(\$77.10)
3)Nov-Dec	9 mos.	(\$9.56)	\$66.18	(\$85.29)
4)Apr-May	6 mos.	(\$32.64)	\$27.27	(\$92.54)
5)Sep-Oct	7 mos.	(\$34.66)	\$39.52	(\$108.85)
6)Nov-Dec	7.5 mos.	(\$37.13)	\$31.49	(\$105.75)

Other results pertaining to cowherd profitability were that 1) the profitability of beef cowherd ownership has been extremely low over the last ten years, with only one management option averaging positive returns over variable costs and no management option even coming close to covering its total costs. 2) The variability of returns to cowherd ownership have been extremely great for all calving season management strategies, as evidenced by the wide range of returns minus variable costs (+/-) one standard deviation around the mean. And 3) the differences in average profitability between calving seasons add up over time. For example, there is only two months separating early from late spring calving and the average difference in ret-vc was \$39.43 per head. The difference for 50 cows would be \$1,972 per year; the difference for 200 cows would be \$7,887 per year; and for 200 cows over the ten years of this analysis the difference would have been \$78,870.

#### MAJOR VARIABLES

##### Cow unit feed costs:

Beef cow rations were based on the feed necessary to sustain a cow calving during each of the calving periods in this analysis and were held constant from year to year. Feed costs were



derived by multiplying the applicable yearly feed prices by the fixed beef cow rations. As a result, the differences in costs among calving seasons were very consistent, with standard deviations of less than one percent. Over the ten years of this analysis, late spring calving had the lowest cow unit feed costs, averaging 10.5% less than the early spring period. Fall calving feed costs on the other hand were higher than early spring, averaging 15.6% and 11.5% more for the Sep-Oct and Nov-Dec periods respectively than the early spring period. These percentages are important because they can be used by ag specialists and producers in transforming the additional feed requirements of one calving season over another into additional dollars/cwt. required in selling prices. For example, with the Feb-Mar cow unit feed costs averaging \$158 over the ten years of this analysis, the 15.6% higher feed costs of the Sep-Oct period represent an average \$24.65 of additional revenue needed to cover the additional feed costs. Assuming that both calves are sold weighing 550 lbs, the Sep-Oct born calf would require a \$4.48 higher price/cwt. than the early spring born calf. ( $\$158 \times 15.6\% = \$24.65 / 5.5 \text{ cwt} = \$4.48 \text{ more/cwt}$ )

Overall cowherd profits are a combination of both costs and revenue, because of that, this study developed a measure (CFC/TR) that combines cow unit feed costs (CFC), the major cowherd cost component, with total revenue (TR), the product of beef prices and the pounds of beef sold. Theoretically, the lower the percent cow feed costs are of total revenue, the greater profits would be. This measure found that hypothesis to be true, but more importantly, allowed guidelines to be formed that equated what

that ratio must be in order to meet particular levels of profitability. Returns minus variable and total costs, breakeven prices necessary to cover variable and total costs, and cow unit feed costs divided by total revenue were placed in a table and sorted in descending order by ret-vc. These variables were highly correlated and the guidelines formed from this sorting process are listed below.

CFC/TR	RET-VC	RET-TC
40% & Less	\$135 & Up	Covered
50% - 40%	\$40 - \$134	\$0 - (\$140)
51% & More	Can't Cover	Can't Cover

From this data it can be seen that long run cowherd profitability will be difficult to achieve for any calving season management strategy unless cow unit feed costs are forty percent or less of total cow unit revenue. This measure is significant because it can be used by producers and ag specialists when analyzing individual cow-calf operations. It is a useful measure of overall cowherd economic efficiency with the forty percent level representing a maximum allowable target for individual cowherd profitability.

#### Cattle Prices:

Overall cattle prices are a major determinant of cowherd profits. Steer, heifer and cull cow prices were evaluated separately, but none proved to have any significant effects on an individual basis. It appeared that fluctuations between the prices of steers, heifers and cull cows in any given year occurred randomly and that higher than average steer prices for example, would sometimes be offset by average or lower than

average prices for beefers and/or cull cows. Because of these problems, an aggregated measure of beef prices was utilized when analyzing the relationships between calving seasons rather than separate prices for steers, beefers and cull cows. The measure used was the average price per pound of calf produced, or AP/PP.<sup>2</sup>

When evaluating the relationships between calf prices of different calving seasons it is not only important to look at what the historical price relationships have been, but to also measure the price relationships that would have been necessary for them to have all had equal returns over their costs. The Feb-Mar calving period was again used as the basis of comparison. First, the AP/PP was calculated for each calving season strategy, then the average calf prices needed for each of the other calving management options to equal the ret-vc for the Feb-Mar period were calculated (PN).<sup>3</sup> The AP/PP's and PN's for each calving season were then divided by the AP/PP for the Feb-Mar calving period in order to put these measures on a percentage basis. The resulting price relationships for the Apr-May, Sep-Oct and Nov-Dec calving seasons (when weaning @ 9 months of age) are shown on figures 3-5. Conclusions that can be drawn from these graphs are:

Figure 3) 3-4 Cwt vs. 4-5 Cwt calves sold on November 1.  
The 352 lbs of calf produced in the Apr-May time period has  
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<sup>2</sup>AP/PP = TR - cull cow revenue / lbs of calf produced.  
Cull cow revenue was omitted so the measure could focus solely on calf prices and their effects on cowherd profitability.

<sup>3</sup>The equation used to calculate PN for Apr-May calving is given as an example:  $PN = \text{ret-vc for Feb-Mar} - \text{ret-vc for Apr-May} / \text{the lbs of calf produced in Apr-May} + \text{the AP/PP for Apr-May}$ .

Figure 3.

# AVG PRICES NEEDED TO EQUAL FEB-MAR APR-MAY AS A % OF FEB-MAR

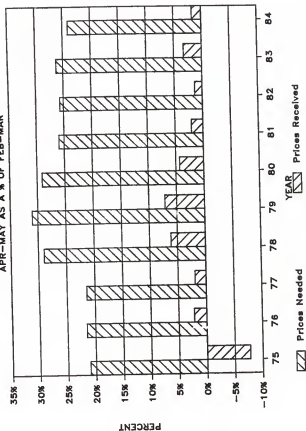


Figure 4.

# AVG PRICES NEEDED TO EQUAL FEB-MAR

SEP-OCT/9mo. AS A % OF FEB-MAR

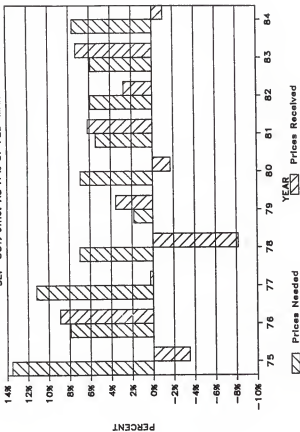
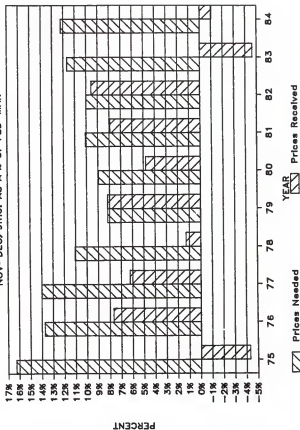


Figure 3.

# AVG PRICES NEEDED TO EQUAL FEB-MAR

NOV-DEC/9mo. AS A % OF FEB-MAR



historically received a 2.26% higher price than the 482 lbs of Feb-Mar born calf when both were sold on November 1, but in order to breakeven with the heavier Feb-Mar calf it would have needed an average premium of 25.52%.

Figure 4) 4-5 Cwt calves sold on July 1 vs. November 1. The 505 lbs of calf born in the Sep-Oct period and sold on July 1 has historically needed a 7.33% price premium over the 482 lbs of Feb-Mar calf sold November 1, but has actually averaged only a 1.46% price premium. It should be noted though, that the Sep-Oct born calf did receive the price premium necessary four out of the ten years of the analysis.

Figure 5) 4-5 Cwt calves sold September 1 vs. November 1. The 477 lbs of calf born in the Nov-Dec period and sold on September 1 has historically needed an 11.63% price premium over the 482 lbs of Feb-Mar calf sold November 1, but has actually averaged only a 3.58% premium.

#### Investment and Asset Turnover:

Investment is a measure of the capital necessary to own and operate a beef cowherd, and because of the acres needed per cow, is strongly influenced by land prices. Investment for spring calving averaged \$4227 while fall calving herds average \$395 more at \$4622, this was largely due to the additional 1.5 acres needed for fall calving herds on native range.

Gross asset turnover is the ratio of total revenue over investment, and averaged between 7.3% and 9.1% for all calving operations. Inverted, this measure can be used to indicate the total assets necessary to gross a dollar of total revenue. This measure averaged from \$13.70:1 to \$10.99:1, which suggests

that a large amount of capital is necessary to operate a cow-calf program.

Net asset turnover is the measure of returns over total cost divided by total revenue and can be a proxy value for the opportunity cost of ranching. Over the ten years of this analysis, all of the calving season strategies averaged negative returns to investment, -1.64% to -2.56%.

#### CALVING SEASON STRATEGY COMPARISONS

##### Fall Calving and Weaning at 7 months vs. 9 months:

Calves born in the early fall period, reach seven months of age in May, when seasonal prices are generally quite high. Calves born in the late fall period reach seven months of age in July, which is a time when grass quality begins to decline and the resulting late summer calf gains are quite low. For these reasons weaning fall born calves at seven months of age is sometimes seen as an alternative to weaning at nine months of age when the calf is heavier. The question of whether to wean the fall born calf at seven months of age or nine was seen as an option of the producer when the calf was seven months of age. Thus, in the shortrun, all costs were seen as sunk.

Early Fall: In the September-October calving period, weaning at nine months of age was the more profitable strategy each of the ten years of this analysis with average returns over variable costs \$28.51 higher per head than weaning at seven months of age. Although the 406 lbs of calf produced on May 1 averaged an 8% higher price than the 505 lbs of calf two months later, it was



far short of the 19% price premium it would have needed for both calves to have broken even with their variable costs.<sup>4</sup>

Late Fall: In the November-December calving period, weaning at nine months of age was again the more profitable strategy for each of the ten years of the analysis, with average ret-vc \$27.57 higher per head than seven month weaning. This was primarily because the price for the 420 lbs of calf sold on July 15 was on average, equal to the 477 lbs of calf sold on September 1, resulting in lower overall returns.

#### Fall Calving. Early vs. Late:<sup>5</sup>

Little difference in profitability was found between early and late fall calving strategies, with calves born in the Sep-Oct period averaging only \$3.41 more returns over variable costs than the Nov-Dec calves. This relative closeness was largely due to the fact that some variables tended to offset each other. The early fall born calf, being older, was better equipped to both withstand the winter cold and utilize the grass in spring, as a result, the Sep-Oct calving strategy produced 28 more lbs per cow unit. This advantage in gain was nearly offset though, by an average selling price 2% lower (July 1 price lower than Sep 1) and an average cow unit feed cost 4.1% higher.

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<sup>4</sup>The average price necessary to breakeven with variable costs were \$49.73 and \$61.33 for the 9 and 7 month old calves respectively.  $(49.77/61.33 = .8108$ : so \$49.73 is 18.91% < \$61.33)

<sup>5</sup>In the analysis of early and late fall calving programs, weaning at nine months was assumed since it was shown to be the more profitable strategy in an earlier section.

Spring Calving, Early vs. Late:

The calving season strategy comparison indicated early spring was by far the more profitable with average returns minus variable costs \$39.43 higher than the Apr-May calving period. Although the cow unit feed costs averaged 10.5% less in the late spring, the two month older calves born in the Feb-Mar period produced nearly 130 more pounds of beef. The lighter late spring calves would have required a price premium of 25.52% over the heavier early spring calves, but on average received only a 2.26% higher price.

Early Spring vs. Early Fall:

The Feb-Mar and Sep-Oct calving periods were shown to be the two most profitable calving seasons in this analysis, as measured by ret-vc. Early spring calving achieved the highest profits or least losses six years out of the ten in this study while early fall calving did the other four. Early spring was deemed the more profitable, being the only strategy to average positive returns over variable costs, \$12.94 more per head than early fall. A closer look at some variable relationships show that the Sep-Oct period, although producing more pounds, 505 to 482, also encountered 15.64% higher cow unit feed costs. The analysis of breakeven (over variable costs) prices revealed that the Sep-Oct horn calf sold on July 1 would need a 7.33% higher average price than the lighter Feb-Mar calf sold on November 1. This price premium however, averaged only 1.46% throughout the length of this analysis.

Fall Calving, Year Round Native Range vs. Supplemental Fescue:

In this study it was found that by utilizing supplemental

fescue pasture, cow unit feed costs could be lowered and returns over variable costs increased over the same calving period when using year round native range. In the case of Sep-Oct calving, cow unit feed costs were decreased \$20.26 and ret-vc were increased \$21.60 per period, which resulted in an average positive return over variable costs of \$15.45 throughout the analysis, as opposed to the negative \$6.15 it earned on year round native range.

#### RETAINED OWNERSHIP ANALYSIS

The final section of this research dealt with retained ownership. Applicable options from drylot backgrounding to grazing were analyzed for each calving period with each option being evaluated at a point when the calf weighed 750 lbs.

TABLE 5.--Ret-VC with retained ownership at 750 lbs

Management Option	Cow/Calf	Ret.Ownership	Total	Date @750
1)Feb-Mar 2.25 ADG	\$6.80	\$20.88	\$27.68	Jan 28
1.25 ADG	\$6.80	(\$21.72)	(\$14.92)	Apr 10
2)Apr-May 2.25 ADG	(\$32.64)	\$69.01	\$36.37	Apr 3
1.25 ADG/full graze	(\$32.64)	(\$3.94)	(\$36.58)	Jul 3
1.25 ADG/int. graze	(\$32.64)	\$15.47	(\$17.16)	Jul 3
3)Sep-Oct/9 mo. 2.25 ADG	(\$6.15)	\$3.98	(\$2.17)	Sep 15
4)Sep-Oct/7 mo.				
Int.graze/2.25 ADG	(\$34.66)	\$9.46	(\$25.21)	Sep 23
Full graze until 655#	(\$34.66)	\$4.46	(\$30.21)	Oct 1
5)Nov-Dec/9 mo. 2.25 ADG	(\$9.56)	\$4.64	(\$4.92)	Dec 1
6)Nov-Dec/7.5 mo.				
2.25 ADG	(\$37.13)	\$18.72	(\$18.41)	Nov 13

Table 5 points out the fact that retained ownership can improve the overall profitability of most calving season

management strategies. For every calving season in the study, there was at least one production option that earned positive returns over variable costs and improved the total returns of the cow-calf operation. It should be noted however, that for retained ownership to be successful, the calves must be managed to gain as fast as possible. Backgrounding at 1.25 lbs/day and full season grazing strategies often had low or negative returns over variable costs.

Comparisons of the various strategies suggested that, although there was increased profitability with nearly every retained ownership option, only the spring calving seasons were improved enough to significantly cover their variable costs. In the Feb-Mar calving period, retained ownership earned an average of \$20.88 per year, increasing the total returns over variable costs for the complete cattle operation to \$27.68. The Apr-May calf performed even better, averaging \$69.01 per year and increasing the total returns over variable costs from (\$32.64) to \$36.37, \$8.69 more than the Feb-Mar period. The superior performance of the late spring horn calf can largely be attributed to two factors. First, being a lighter calf going on feed in the fall, it took less feed for it to gain at the same rate as the larger early spring calf, resulting in lower feed costs. Secondly, when fed to 750 lbs, the late spring calf is sold in April when feeder calf prices are seasonally quite high, on the other hand, the Feb-Mar horn calf reached 750 lbs during January when prices are lower on a seasonal basis.

Further analysis of the spring calving seasons indicated that by feeding both calves until April 25, a time when many

backgrounding programs are typically completed, the early spring calves were then more profitable. The Feb-Mar born calf averaged slightly higher overall returns minus variables costs than the Apr-May calves, \$55.27 to \$51.67, even though the late spring calves earned \$35.84 more in the backgrounding phase.

## CHAPTER V

### DISCUSSION AND SUMMARY

The purpose of this thesis was to evaluate the impacts of calving season on cowherd profitability. The budgeting technique was the primary analytical tool with eight different calving season management options being analyzed. The simulated performance and nutritional requirements of a black baldy cow and her exotic sired calf were combined with the appropriate yearly input and calf prices to construct budgets for each of the years, 1975 through 1984. All factors of production that were not directly affected by calving season were held constant or in constant proportion throughout the analysis. This framework allowed the study to focus on cow unit feed costs and calf prices as the major variables and to illustrate the effects different calving seasons would have on the same cow-calf pair.

The results of this analysis, while not answering the question of which calving season is best for a particular operation, were intended to help in the decision making process. By evaluating certain key variables, significant relationships were sought that could aid producers and ag specialists in both, making the calving season decision and analyzing individual cow-calf operations. It was hoped, that by knowing the feed cost and

calf price relationships that occur, producers and ag specialists would be better equipped to make informed decisions on which calving season is best for a particular farm or ranch.

The completed budgets supported analyses from industry sources revealing low average returns coupled with high year to year variability of cowherd profitability. These results, combined with the high capital investment necessary and low rate of returns to cowherd ownership, imply that there are both financial and risk barriers to entry in the cow-calf business. The findings suggest that only those producers who are well established and willing to accept low returns to their investment can survive. Highly leveraged operators will face severe financial difficulties at current interest rates. For example, if we assume 14% interest and average gross returns to investment of 8%, this implies a maximum allowable leverage ratio of 57%.

Given the same resource base, year round native range, early spring calving was the most profitable strategy in this analysis. The Feb-Mar calving period was the only calving season to average positive returns over its variable costs. No calving season covered its total costs of production. This was due largely to two factors, large calf size and low cow feed costs. The results indicated that spring calving cowherds, by better matching cow needs with range nutritional value, had lower feed costs than fall calving herds. Early spring calving averaged 11-16% lower feed costs than the fall periods, while feed costs for the late spring period averaged 21-26% lower. The larger Feb-Mar calves were able to use these lower feed costs to earn positive returns

to variable costs, while the 130 lbs lighter Apr-May calves lost an average of \$32.64.

In fall calving cowherds, it was found that calf size again played a big role, with the more profitable management strategies being those weaning the larger nine month old calves as opposed to the lighter seven month old calves. In addition, fall calving cowherd returns were found to be improved with the implementation of a supplemental fescue pasture option. In the case of Sep-Oct calving, fescue pasture lowered cow feed costs an average of \$20.26 and increased average returns over variable costs \$21.60, from (\$6.15) to \$15.45 . This finding does not imply that fall calving operations on fescue pasture are the best overall, but does point out how changes in forage resources can make significant differences in cowherd profitability. Budgets for spring calving cowherds on fescue pasture were not included in this analysis, but it is believed that spring calving cattle would have had similar if somewhat smaller increases in returns to their variable costs. It should be noted that in this analysis, it was assumed that land in fescue had few alternative uses and thus the opportunity costs were low. In actual practice, the per acre returns to land in fescue must out weigh the per acre returns of the most profitable alternative use before it is economically feasible to utilize fescue pasture. The research in this thesis concerning forage resources is limited, but the results do indicate that alternative resources can make significant impacts on cowherd profitability. Further research is necessary in the area of alternative cowherd forages and their effects on cow unit feed costs.



Because cowherd profits are affected by both costs and revenue, the ratio of cow unit feed costs over total revenue was evaluated in this thesis. The analysis indicated that long run profitability for any calving season strategy would be difficult unless cow unit feed costs were forty percent or less of total cow unit revenue. This measure could be utilized by producers and ag specialists as an excellent indicator of cowherd economic efficiency, but further testing with actual farm records is needed before it is used extensively.

Cattle prices were found to be the critical factor in determining overall cowherd profitability, with positive returns for any calving season being dependent upon above average prices. Because fluctuations in the premium structure between steer, heifer and cow prices made analyses of individual prices difficult, the average price per pound of calf produced was used as the chief measure of cattle prices. Although cattle prices are strongly influenced by seasonal trends and premiums between weight classifications, in this study it was found that these price differentials had less influence on profitability than factors such as cow feed costs and calf weights. Because of this, it is the opinion of this author that producers should concentrate not on matching calving season strategies with seasonal highs in prices, but on organizing a complete marketing plan for the cattle they produce. This plan should begin with a comprehensive analysis of all the market alternatives, from forward contracts to options on cattle futures contracts, that are available to their operation. From there the marketing plan can evaluate these alternatives on a regular basis allowing

producers the opportunity to price their cattle throughout the year instead of when their calving season dictates.

Retained ownership strategies were the final section of this study. Comparisons of the various strategies suggested that, although retained ownership can often improve overall profitability, only the spring calving seasons were improved enough to significantly cover their overall variable costs. This resulted from the spring born calves being able to take advantage of the seasonally higher prices which occur after a typical overwintering program. The fall calving seasons on the other hand, while often earning positive returns over variable costs to retained ownership, still did not earn enough to make up for the losses of the cow-calf phase. This is a significant finding, because it tends to refute the argument of many fall calving producers that the older fall born calf, will make up for their increased feed costs and return more than the spring calf when both are sold in the fall. The results of this study indicated that even after retaining ownership until the calf weighed 750 lbs, no fall calving strategy was able to cover their average overall variable costs. While the Feb-Mar born calf was able to average a \$6.80 return over its variable costs during the cow-calf phase.

Another notable finding from the research of retained ownership was that, to be successful calves must be managed to gain as fast as possible. Backgrounding at 1.25 lbs/day and full season grazing options often resulted in low to negative returns over variable costs.

In addition, the results indicated that there was a definite place in the cattle industry for backgrounding operations. The Apr-May born calves in particular proved to be a profitable cattle enterprise on their own, with average returns over variable costs of \$69.01 per head. Plus they were able to cover their total costs of production six years out of the ten in this analysis.<sup>1</sup> Because of the higher returns and the lower capital needs associated with backgrounding, this author believes backgrounding operations may represent one of the few ways that young and highly leveraged operators can survive in the cattle industry. As the cattle feeding industry becomes more concentrated, cattlemen who can 1) do a good job of assembling, buying and selling, lot sized groups of cattle. And 2) effectively handle the greater health risks of these younger, more fragile animals will provide a vital service to the industry and in turn be one of the more profitable segments of the beef cattle industry.

The above findings warrant continued research in the area of retained ownership and backgrounding or growing out of calves and yearlings. The key areas of analysis should focus on the price relationships involved throughout the growing phase and not just when the calf is bought or sold. In addition, the feeding or buy/sell margins should be evaluated for trends and particular levels identified that are necessary for profitability.

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<sup>1</sup>Feeding the younger calves was profitable because it took less feed for them to gain at the same rate as larger calves, and thus were more efficient. It is important to remember that the Apr-May born calf entered the backgrounding lot at six months of age, and thus was lighter because of its age and not because of its genetics or health. In practice, backgrounders and potential backgrounders should keep that in mind when buying their cattle.

## APPENDIX 1      BEEF COWHERD COST-RETURN BUDGETS

The actual yearly beef cowherd cost-return budgets used in this thesis are as follows:

## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET

1984

*** COSTS ***	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
I. TOTAL VARIABLE COSTS		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$108.88	\$108.88	\$121.68	\$121.68	\$121.68	\$121.68	\$83.28	\$83.28
b. Fescue Pasture/rent & fert./ACD		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$71.67	\$71.67
c. Alfalfa Hay		\$39.87	\$37.69	\$75.39	\$57.48	\$75.39	\$57.48	\$13.75	\$16.66
d. SBM 44s		\$0.00	\$0.00	\$0.00	\$8.85	\$0.00	\$8.85	\$0.00	\$0.00
e. Mineral & Salt		\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32	\$3.32
f. Grain		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
g. Grass Hay		\$9.72	\$9.72	\$18.96	\$18.96	\$18.96	\$18.96	\$7.21	\$7.98
Total Cow Unit Feed Costs		\$181.72	\$159.53	\$211.27	\$202.21	\$211.27	\$202.21	\$179.16	\$182.76
2. Bull & Replace. Feed Costs/C-C unit		\$52.58	\$52.58	\$52.58	\$52.58	\$52.58	\$52.58	\$52.58	\$52.58
Total Feed Costs		\$234.30	\$212.11	\$263.86	\$254.79	\$263.86	\$254.79	\$231.74	\$235.34
B. Labor		\$25.20	\$25.20	\$33.68	\$33.68	\$33.68	\$33.68	\$33.68	\$33.68
C. Other Variable Costs (Held Constant)		\$55.85	\$55.85	\$55.85	\$55.85	\$55.85	\$55.85	\$55.85	\$55.85
D. Interest (= half of VC x int. rate)		\$22.86	\$21.25	\$25.61	\$24.95	\$25.61	\$24.95	\$23.29	\$23.55
TOTAL VARIABLE COSTS		\$338.21	\$314.41	\$378.92	\$369.28	\$378.92	\$369.28	\$344.48	\$348.34
II. TOTAL FIXED COSTS (Held Constant)		\$167.82	\$167.82	\$167.82	\$167.82	\$167.82	\$167.82	\$167.82	\$167.82
III. TOTAL COSTS (TVC+TFC)		\$505.23	\$481.44	\$545.94	\$536.22	\$545.94	\$536.22	\$511.58	\$515.36
*** RETURNS ***									
	BORN : WEANED:	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer wean weight		558	483	578	546	464	481	578	546
B. Heifer wean weight		521	388	545	515	438	453	545	515
C. Calf Los Procedure/Cow		482	352	585	477	486	428	585	477
IV. PRICES									
A. Steer Price/Cwt at Weaning		\$66.31	\$68.18	\$66.83	\$64.99	\$71.11	\$66.21	\$66.83	\$64.99
B. Heifer Price/Cwt at Weaning		\$57.88	\$56.52	\$55.58	\$57.17	\$59.31	\$55.68	\$55.58	\$57.17
C. Cull Cow Price/Dwt		\$36.73	\$36.73	\$41.78	\$38.51	\$44.64	\$39.65	\$41.78	\$38.51
V. REVENUE									
A. Steer Revenue (\$)		\$164.12	\$123.64	\$171.74	\$159.68	\$148.48	\$143.31	\$171.74	\$159.68
B. Heifer Revenue (\$)		\$89.89	\$64.43	\$98.74	\$88.33	\$77.93	\$75.56	\$98.74	\$88.33
C. Cull Cow Revenue (\$)		\$68.68	\$68.68	\$68.94	\$63.54	\$73.66	\$65.42	\$68.94	\$63.54
TOTAL REVENUE		\$313.81	\$248.68	\$338.42	\$311.55	\$300.07	\$284.29	\$338.42	\$311.55
*** ANALYSIS ***									
I. REVENUE-VARIABLE COSTS		(\$24.48)	(\$65.73)	(\$47.58)	(\$57.65)	(\$78.85)	(\$84.91)	(\$13.85)	(\$36.79)
II. REVENUE-TOTAL COST		(\$191.42)	(\$232.76)	(\$214.52)	(\$224.67)	(\$245.88)	(\$251.93)	(\$180.88)	(\$203.81)
III. CULF BREAK-EVEN PRICE (Variable Costs)		\$57.68	\$72.83	\$61.34	\$64.82	\$75.21	\$72.88	\$54.52	\$59.65
IV. CULF BREAK-EVEN PRICE (Total Costs)		\$92.26	\$119.44	\$94.39	\$99.08	\$116.36	\$112.82	\$87.58	\$94.63
V. INVESTMENT*		\$4,247	\$4,236	\$4,639	\$4,634	\$4,639	\$4,634	\$4,357	\$4,359
ASSET TURNOVER :									
VI. NET (L.V.I.)/INVESTMENT(L.V.V.)		-2.29%	-3.27%	-2.68%	-2.82%	-3.27%	-3.41%	-1.97%	-2.52%
VII. GROSS(Tot. Rev.)/INVESTMENT(L.V.V.)		9.68%	8.89%	9.17%	8.75%	8.58%	8.17%	9.77%	9.31%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.



## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET

1983

### COSTS ###	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
I. TOTAL VARIABLE COSTS									
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$108.00	\$108.00	\$121.50	\$121.60	\$121.60	\$121.60	\$83.20	\$83.20
b. Fescue Pasture (rent & fert./AC)		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$75.38	\$75.38
c. Alfalfa Hay		\$46.25	\$29.12	\$58.25	\$44.41	\$38.25	\$44.41	\$18.63	\$12.68
d. SBM 44%		\$0.00	\$0.00	\$0.00	\$7.00	\$0.00	\$7.00	\$0.00	\$0.00
e. Mineral & Salt		\$3.31	\$3.31	\$3.31	\$3.31	\$3.31	\$3.31	\$3.31	\$3.31
f. Grain		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
g. Grass Hay		\$8.20	\$8.20	\$9.24	\$9.24	\$9.24	\$9.24	\$6.00	\$6.67
Total Cow Unit Feed Costs		\$165.57	\$149.43	\$192.41	\$185.65	\$192.41	\$185.65	\$178.60	\$181.43
2. Bull & Replace. Feed Costs/C-C unit		\$46.94	\$46.94	\$46.94	\$46.94	\$46.94	\$46.94	\$46.94	\$46.94
Total Feed Costs		\$212.51	\$196.37	\$239.35	\$232.59	\$239.35	\$232.59	\$225.54	\$228.37
B. Labor		\$27.42	\$27.42	\$36.56	\$36.56	\$36.56	\$36.56	\$36.56	\$36.56
C. Other Variable Costs (Held Constant)		\$51.32	\$51.32	\$51.32	\$51.32	\$51.32	\$51.32	\$51.32	\$51.32
D. Interest (= Half of VC x int. rate)		\$28.68	\$19.46	\$23.15	\$22.67	\$23.15	\$22.67	\$22.17	\$22.37
TOTAL VARIABLE COSTS		\$312.93	\$294.57	\$358.38	\$343.14	\$358.38	\$343.14	\$335.59	\$338.62
II. TOTAL FIXED COSTS (Held Constant)		\$178.15	\$178.15	\$178.15	\$178.15	\$178.15	\$178.15	\$178.15	\$178.15
III. TOTAL COSTS (TVC+FFC)		\$483.08	\$464.72	\$528.53	\$513.29	\$528.53	\$513.29	\$505.74	\$506.77
### RETURNS ###	BORN : WEANED:	FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
A. Steer Wean Weight		558	483	578	546	464	481	578	546
B. Heifer Wean Weight		521	380	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	585	477	486	428	585	477
II. PRICES									
A. Steer Price/Cwt at Weaning		\$62.26	\$64.98	\$65.71	\$58.70	\$76.10	\$65.71	\$65.71	\$58.70
B. Heifer Price/Cwt at Weaning		\$51.89	\$52.23	\$57.21	\$58.34	\$62.75	\$57.83	\$57.21	\$58.34
C. Cull Cow Price/Cwt		\$35.21	\$35.21	\$42.28	\$38.53	\$43.18	\$41.32	\$42.28	\$38.53
III. REVENUE									
A. Steer Revenue (\$)		\$154.89	\$117.84	\$178.91	\$144.23	\$158.98	\$142.23	\$178.91	\$144.23
B. Heifer Revenue (\$)		\$81.18	\$59.54	\$93.54	\$77.78	\$82.45	\$77.58	\$93.54	\$77.78
C. Cull Cow Revenue (\$)		\$58.10	\$58.10	\$69.76	\$63.57	\$71.25	\$68.18	\$69.76	\$63.57
TOTAL REVENUE		\$293.29	\$235.48	\$332.21	\$285.58	\$312.60	\$287.91	\$332.21	\$285.58
### ANALYSIS ###									
I. REVENUE-VARIABLE COSTS		(\$19.64)	(\$59.09)	(\$16.17)	(\$57.57)	(\$37.78)	(\$55.23)	(\$1.38)	(\$53.05)
II. REVENUE-TOTAL COST		(\$189.79)	(\$229.24)	(\$186.32)	(\$227.72)	(\$207.93)	(\$225.38)	(\$171.53)	(\$223.20)
III. CULF BREAK-EVEN PRICE (Variable Costs)		\$52.88	\$67.11	\$55.53	\$58.55	\$68.77	\$65.42	\$52.88	\$57.61
IV. CULF BREAK-EVEN PRICE (Total Costs)		\$88.18	\$115.40	\$89.28	\$94.19	\$118.69	\$105.98	\$86.27	\$93.25
V. INVESTMENT*		\$4,464	\$4,455	\$4,880	\$4,876	\$4,880	\$4,876	\$4,574	\$4,575
ASSET TURNOVER :									
VI. NET (Ln. II.)/INVESTMENT (Ln. V.)		-2.39x	-2.98x	-1.84x	-2.69x	-2.28x	-2.64x	-1.64x	-2.77x
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln. V.)		8.73x	7.45x	8.83x	7.83x	8.38x	7.88x	9.42x	8.35x

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1983

## FACTORS THAT VARY BY CALVING SEASON ##				SPRING		FALL		FALL		FALL FESCUE	
UNIT		PRICE		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
))))))))))))))))))))))==(Amounts are units per head per year)											
I. COW UNIT FEED COSTS											
A. Native Range	AC	\$12.00		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
B. Fescue Pasture*	AC	\$24.00		0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5
C. Alfalfa Hay	TONS	\$54.00		0.84	0.53	1.06	0.81	1.06	0.81	0.19	0.23
D. SBM 44%	TONS	\$240.00		0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00
E. Mineral & Salt	CMT	\$5.01		0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain	BU	\$2.77		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Grass Hay	TONS	\$43.00		0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert.	AC	\$25.37		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.00	\$38.00
I. LABOR		\$4.57		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
III. REVENUE FACTORS				BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT
WEANED:				NOV 1	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1
-----											
A. Steer Price/Cwt at Weaning		\$62.26		\$64.98	\$65.71	\$58.70	\$76.10	\$65.71	\$65.71	\$58.70	
B. Steer Weight		550		483	578	546	464	481	578	546	
C. Heifer Price/Cwt at Weaning		\$51.89		\$52.23	\$57.21	\$50.34	\$62.75	\$57.83	\$57.21	\$50.34	
D. Heifer Weight		521		390	545	515	438	453	545	515	
E. Days of Age at Sale		245		184	273	274	212	227	273	274	
F. Cull Cow Price/Cwt.		\$35.21		\$35.21	\$42.28	\$36.53	\$43.18	\$41.32	\$42.28	\$38.53	
-----											
## FACTORS HELD CONSTANT BY CALVING SEASON ##				VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) ##							
I. OTHER VARIABLE COSTS				A. % Calf Crop							
A. Utilities, Fuel & Oil				\$17.21							
B. Vet. & Drugs				\$7.25							
C. Marketing & Breeding				\$6.39							
D. Repairs, Tools & Supplies				\$13.49							
E. Auto Expense				\$2.72							
F. Misc.				\$3.26							
G. Implants				\$1.00							
II. BUILDINGS & EQUIPMENT				H. Cow Life							
A. Investment				\$323							
B. Life				10							
C. % Tax & Insurance for Bldg/Eqp, Livestk				1.0%							
-----											
III. INTEREST RATES				** The values in section VI. BREEDING HERD, are							
A. Operating Rate----- (%)				14.15%							
B. Fixed Funds Rate----- (%)				12.50%							
-----											
IV. NATIVE RANGE VALUE/ACRE				\$411							
V. FESCUE PASTURE VALUE/ACRE				\$622							



\*\*\* CALVING SEASON STRATEGIES \*\*\*  
DEEF COWHERD COST-RETURN BUDGET

1982

### COSTS ###	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
I. TOTAL VARIABLE COSTS									
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$108.00	\$108.00	\$121.60	\$121.60	\$121.60	\$121.60	\$83.20	\$83.20
b. Fescue Pasture (rent & fert./AC)		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$78.90	\$78.90
c. Alfalfa Hay		\$50.71	\$31.92	\$63.85	\$48.68	\$63.85	\$48.68	\$11.65	\$14.11
d. SBM 44x		\$0.00	\$0.00	\$0.00	\$7.38	\$0.00	\$7.38	\$0.00	\$0.00
e. Mineral & Salt		\$3.31	\$3.31	\$3.31	\$3.31	\$3.31	\$3.31	\$3.31	\$3.31
f. Grain		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
g. Grass Hay		\$9.82	\$9.82	\$10.17	\$10.17	\$10.17	\$10.17	\$6.69	\$7.33
Total Cow Unit Feed Costs		\$171.83	\$153.84	\$198.92	\$191.13	\$198.92	\$191.13	\$183.82	\$186.93
2. Bull & Replace. Feed Costs/C-C unit		\$49.48	\$49.48	\$49.48	\$49.48	\$49.48	\$49.48	\$49.48	\$49.48
Total Feed Costs		\$221.31	\$203.32	\$248.40	\$240.61	\$248.40	\$240.61	\$233.30	\$236.41
B. Labor		\$22.62	\$22.62	\$38.16	\$38.16	\$38.16	\$38.16	\$38.16	\$38.16
C. Other Variable Costs (Held Constant)		\$49.34	\$49.34	\$49.34	\$49.34	\$49.34	\$49.34	\$49.34	\$49.34
D. Interest (= 1/2 of VC x int. rate)		\$23.90	\$22.27	\$26.61	\$25.90	\$26.61	\$25.90	\$25.38	\$25.64
TOTAL VARIABLE COSTS		\$317.87	\$298.75	\$354.51	\$346.38	\$354.51	\$346.00	\$338.18	\$341.54
II. TOTAL FIXED COSTS (Held Constant)		\$184.31	\$184.31	\$184.31	\$184.31	\$184.31	\$184.31	\$184.31	\$184.31
III. TOTAL COSTS (TVC+TFC)		\$501.38	\$481.06	\$538.82	\$530.69	\$538.82	\$530.39	\$522.49	\$525.85
*** RETURNS ***									
	BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer Wean Weight		550	483	578	546	464	481	578	546
B. Heifer Wean Weight		521	380	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	585	477	486	420	585	477
II. PRICES									
A. Steer Price/Cwt at Weaning		\$64.25	\$66.13	\$66.36	\$69.94	\$70.95	\$68.35	\$66.36	\$69.94
B. Heifer Price/Cwt at Weaning		\$56.48	\$55.83	\$56.93	\$61.98	\$59.28	\$58.21	\$56.93	\$61.98
C. Cull Cow Price/Cwt		\$36.82	\$36.82	\$43.87	\$41.13	\$44.95	\$42.88	\$43.87	\$41.13
III. REVENUE									
A. Steer Revenue (\$)		\$158.52	\$119.93	\$172.68	\$171.84	\$148.14	\$147.94	\$172.68	\$171.84
B. Heifer Revenue (\$)		\$88.28	\$62.73	\$93.88	\$95.76	\$77.79	\$79.11	\$93.88	\$95.76
C. Cull Cow Revenue (\$)		\$68.75	\$68.75	\$71.87	\$67.86	\$74.17	\$78.62	\$71.87	\$67.86
TOTAL REVENUE		\$305.55	\$251.41	\$336.75	\$335.47	\$300.10	\$297.67	\$336.75	\$335.47
*** ANALYSIS ***									
I. REVENUE-VARIABLE COSTS		(\$9.51)	(\$53.34)	(\$17.76)	(\$10.62)	(\$54.41)	(\$48.41)	(\$1.43)	(\$6.08)
II. REVENUE-TOTAL COST		(\$193.82)	(\$237.65)	(\$202.07)	(\$194.92)	(\$238.72)	(\$232.72)	(\$185.74)	(\$190.38)
III. CULF BREAK-EVEN PRICE (Variable Costs)		\$53.18	\$66.98	\$56.89	\$58.27	\$69.87	\$65.54	\$52.86	\$57.32
IV. CULF BREAK-EVEN PRICE (Total Costs)		\$91.43	\$119.29	\$92.96	\$96.87	\$114.47	\$109.39	\$89.33	\$95.92
V. INVESTMENT*		\$4,738	\$4,728	\$5,182	\$5,178	\$5,182	\$5,178	\$4,875	\$4,877
ASSET TURNOVER :									
VI. NET (Ln. II.)/(INVESTMENT (Ln. V.))		-1.82%	-2.75%	-1.82%	-1.69%	-2.53%	-2.42%	-1.60%	-1.70%
VII. GROSS (Tot. Rev.)/(INVESTMENT (Ln. V.))		8.76%	7.42%	8.57%	8.56%	7.87%	7.83%	9.11%	9.89%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1982

** FACTORS THAT VARY BY CALVING SEASON **		SPRING		FALL		FALL		FALL FESCUE	
UNIT	PRICE	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
))))))))))))))))))))))=((Amounts are units per head per year))									
I. COW UNIT FEED COSTS									
A. Native Range AC	\$12.80	8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5
B. Fescue Pasture+ AC	\$27.28	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5
C. Alfalfa Hay TONS	\$68.13	0.84	0.53	1.06	0.81	1.06	0.81	0.19	0.23
D. GDM 44% TONS	\$258.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Mineral & Salt CWT	\$5.88	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain BU	\$2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Grass Hay TONS	\$48.25	0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert. AC	\$25.37	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.06	\$38.06
II. LABOR	\$3.77	6.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0
III. REVENUE FACTORS									
BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	
WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1	
A. Steer Price/Cwt at Weaning	\$64.85	\$65.13	\$66.36	\$69.94	\$78.95	\$68.35	\$66.36	\$69.94	
B. Steer Weight	550	483	578	546	464	481	578	546	
C. Heifer Price/Cwt at Weaning	\$56.48	\$55.83	\$56.93	\$61.98	\$59.28	\$58.21	\$56.93	\$61.98	
D. Heifer Weight	521	388	545	515	438	453	545	515	
E. Days of Age at Sale	245	184	273	274	212	227	273	274	
F. Cull Cow Price/Cwt.	\$36.82	\$36.82	\$43.87	\$41.13	\$44.95	\$42.88	\$43.87	\$41.13	
**** FACTORS HELD CONSTANT BY CALVING SEASON ****									
I. OTHER VARIABLE COSTS				VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) **					
A. Utilities, Fuel & Oil	\$15.38			A. % Calf Crop				90%	
B. Vet. & Drugs	\$4.71			B. % Steers Weaned for Sale				45%	
C. Marketing & Breeding	\$6.99			C. % Heifers Weaned for Sale				38%	
D. Repairs, Tools & Supplies	\$11.81			D. % Heifers Weaned for Herd Replacement				15%	
E. Auto Expense	\$2.21			E. % Bull per Cow				4%	
F. Misc.	\$8.84			F. Average Cow Value				\$550	
G. Implants	\$1.08			G. Average Bull Value				\$1,500	
II. BUILDINGS & EQUIPMENT				H. Cow Life				8	
A. Investment	\$350			I. Bull Life				3	
B. Life	10			J. Salvage Value/Cow				\$400	
C. % Tax & Insurance for Bldg/Eqp, Livestk	1.8%			K. Salvage Value/Bull				\$500	
				L. Cull Cow Weight				1100	
III. INTEREST RATES				** The values in section VI. BREEDING HERD, are generally regarded as industry averages and are held constant throughout the analysis. Bull and cow values are estimates which are consistent with Kansas State University Farm Management Guide (MF-266)					
A. Operating Rate----- (%)		16.23%							
B. Fixed Funds Rate----- (%)		13.71%							
IV. NATIVE RANGE VALUE/ACRE									
		\$440							
V. FESCUE PASTURE VALUE/ACRE									
		\$682							

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf Lbs Produced/Cows assuming a 90% calf crop = (45% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 38% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced

## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## GEEF CONSIDER COST-RETURN BUDGET

1981

### COSTS ###	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
I. TOTAL VARIABLE COSTS									
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$185.48	\$185.48	\$117.88	\$117.88	\$117.88	\$117.88	\$88.68	\$88.68
b. Fescue Pasture (rent & fert./AC)		\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$76.16	\$76.16
c. Alfalfa Hay		\$49.38	\$31.88	\$62.18	\$47.41	\$62.18	\$47.41	\$11.34	\$13.74
d. SBM 44s		\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88
e. Mineral & Salt		\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15	\$3.15
f. Grain		\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88	\$8.88
g. Grass Hay		\$18.34	\$18.34	\$11.65	\$11.65	\$11.65	\$11.65	\$7.67	\$8.41
Total Cow Unit Feed Costs		\$168.27	\$149.97	\$194.79	\$186.86	\$194.79	\$186.86	\$178.92	\$182.85
2. Bull & Replace. Feed Costs/C-C unit		\$51.22	\$51.22	\$51.22	\$51.22	\$51.22	\$51.22	\$51.22	\$51.22
Total Feed Costs		\$219.48	\$201.18	\$246.88	\$246.88	\$246.88	\$246.88	\$238.13	\$233.27
B. Labor		\$22.44	\$22.44	\$29.92	\$29.92	\$29.92	\$29.92	\$29.92	\$29.92
C. Other Variable Costs (Held Constant)		\$42.99	\$42.99	\$42.99	\$42.99	\$42.99	\$42.99	\$42.99	\$42.99
D. Interest (= Half of VC x int. rate)		\$22.66	\$21.21	\$25.37	\$24.98	\$25.37	\$24.98	\$24.11	\$24.36
TOTAL VARIABLE COSTS		\$307.58	\$287.82	\$344.28	\$337.88	\$344.28	\$337.88	\$327.15	\$338.53
II. TOTAL FIXED COSTS (Held Constant)		\$178.57	\$178.57	\$178.57	\$178.57	\$178.57	\$178.57	\$178.57	\$178.57
III. TOTAL COSTS (TVC+TFC)		\$486.15	\$466.39	\$522.85	\$516.45	\$522.85	\$516.45	\$505.72	\$519.10
=====									
### RETURNS ###	BORN : WEANED:	FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
A. Steer Mean Weight		558	483	578	546	464	481	578	546
B. Heifer Mean Weight		521	388	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	585	477	486	428	585	477
II. PRICES									
A. Steer Price/Cwt at Weaning		\$64.15	\$66.55	\$67.91	\$69.22	\$74.68	\$69.84	\$67.91	\$69.22
B. Heifer Price/Cwt at Weaning		\$55.88	\$55.18	\$59.44	\$68.87	\$62.88	\$58.88	\$59.44	\$68.87
C. Cull Cow Price/Cwt		\$39.25	\$39.25	\$45.88	\$44.28	\$44.88	\$45.28	\$45.88	\$44.28
III. REVENUE									
A. Steer Revenue (\$)		\$158.77	\$128.69	\$176.63	\$178.87	\$155.76	\$149.44	\$176.63	\$178.87
B. Heifer Revenue (\$)		\$87.34	\$62.81	\$97.18	\$92.81	\$82.62	\$78.93	\$97.18	\$92.81
C. Cull Cow Revenue (\$)		\$64.76	\$64.76	\$75.78	\$73.86	\$74.85	\$74.58	\$75.78	\$73.86
TOTAL REVENUE		\$310.87	\$256.26	\$349.52	\$345.94	\$312.44	\$302.95	\$349.52	\$345.94
=====									
### ANALYSIS ###									
I. REVENUE-VARIABLE COSTS		\$3.29	(\$39.56)	\$5.24	(\$1.94)	(\$31.84)	(\$34.94)	\$22.37	\$5.41
II. REVENUE-TOTAL COST		(\$175.27)	(\$218.13)	(\$173.33)	(\$188.51)	(\$218.41)	(\$213.51)	(\$156.28)	(\$173.16)
III. CULF BREAK-EVEN PRICE (Variable Costs)		\$58.38	\$63.31	\$53.15	\$55.47	\$66.57	\$62.65	\$49.76	\$53.93
IV. CULF BREAK-EVEN PRICE (Total Costs)		\$87.43	\$113.99	\$88.48	\$92.87	\$118.57	\$105.13	\$85.89	\$91.33
=====									
V. INVESTMENT*		\$5,176	\$5,167	\$5,671	\$5,668	\$5,671	\$5,668	\$5,288	\$5,289
=====									
ASSET TURNOVER :									
VI. NET (Ln. II.)/INVESTMENT (Ln. V.)		-1.45%	-2.28%	-1.29%	-1.41%	-1.94%	-2.00%	-1.87%	-1.48%
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln. V.)		7.94%	6.75%	7.93%	7.78%	7.28%	7.12%	8.64%	8.38%
=====									

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1981

## FACTORS THAT VARY BY CALVING SEASON ##		UNIT		PRICE		FEB-MAR		APR-MAY		SEP-OCT		NOV-DEC		FALL		FALL		FALL FESCUE	

## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET 1980

*** COSTS ***	BORN :	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
1. TOTAL VARIABLE COSTS	WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Total Feed Costs	AGE IN DAYS:	245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$109.65	\$109.65	\$122.55	\$122.55	\$122.55	\$122.55	\$83.85	\$83.85
b. Fescue Pasture (rent & fert./AC)		\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$68.39	\$68.39
c. Alfalfa Hay		\$42.91	\$27.31	\$54.83	\$41.19	\$54.83	\$41.19	\$9.86	\$11.94
d. SBM 44%		\$8.00	\$8.00	\$8.00	\$7.08	\$8.00	\$7.08	\$8.00	\$8.00
e. Mineral & Salt		\$2.91	\$2.91	\$2.91	\$2.91	\$2.91	\$2.91	\$2.91	\$2.91
f. Grain		\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00
g. Grass Hay		\$8.34	\$8.34	\$9.40	\$9.40	\$9.40	\$9.40	\$6.19	\$6.78
Total Cow Unit Feed Costs		\$163.81	\$147.91	\$188.98	\$183.14	\$188.98	\$183.14	\$171.19	\$173.87
2. Bull & Replace. Feed Costs/C-U unit		\$46.98	\$46.98	\$46.98	\$46.98	\$46.98	\$46.98	\$46.98	\$46.98
Total Feed Costs		\$210.79	\$194.89	\$235.97	\$230.11	\$235.97	\$230.11	\$218.17	\$220.85
8. Labor		\$22.28	\$22.28	\$29.68	\$29.68	\$29.68	\$29.68	\$29.68	\$29.68
C. Other Variable Costs (Held Constant)		\$48.58	\$48.58	\$48.58	\$48.58	\$48.58	\$48.58	\$48.58	\$48.58
3. Interest (= Half of VC x int. rate)		\$19.77	\$18.62	\$22.12	\$21.71	\$22.12	\$21.71	\$28.84	\$21.84
TOTAL VARIABLE COSTS		\$293.26	\$276.21	\$326.89	\$321.92	\$326.89	\$321.92	\$389.11	\$311.98
II. TOTAL FIXED COSTS (Held Constant)		\$168.45	\$168.45	\$168.45	\$168.45	\$168.45	\$168.45	\$168.45	\$168.45
III. TOTAL COSTS (TVG+TFC)		\$461.71	\$444.66	\$495.34	\$490.37	\$495.34	\$490.37	\$557.56	\$480.43
*** RETURNS ***	BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer Mean Weight		358	483	578	546	464	481	578	546
B. Heifer Mean Weight		321	388	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	585	477	486	428	585	477
III. PRICES									
A. Steer Price/Cwt at Weaning		\$78.63	\$81.53	\$76.47	\$82.48	\$82.75	\$77.12	\$76.47	\$82.48
B. Heifer Price/Cwt at Weaning		\$67.28	\$78.66	\$67.16	\$78.89	\$67.23	\$68.12	\$67.16	\$78.89
C. Cull Cow Price/Cwt		\$45.73	\$45.73	\$44.98	\$48.89	\$44.89	\$43.27	\$44.98	\$48.89
III. REVENUE									
A. Steer Revenue (\$)		\$194.61	\$147.85	\$198.98	\$282.65	\$172.78	\$166.93	\$198.98	\$282.65
B. Heifer Revenue (\$)		\$185.16	\$88.55	\$189.81	\$188.29	\$88.34	\$92.58	\$189.81	\$188.29
C. Cull Cow Revenue (\$)		\$75.45	\$75.45	\$74.22	\$88.67	\$72.75	\$71.48	\$74.22	\$88.67
TOTAL REVENUE		\$375.22	\$383.86	\$382.92	\$391.61	\$333.87	\$338.98	\$382.92	\$391.61
*** ANALYSIS ***									
I. REVENUE-VARIABLE COSTS		\$81.96	\$27.65	\$54.83	\$69.69	\$57.08	\$8.98	\$73.81	\$79.63
II. REVENUE-TOTAL COST		(\$86.48)	(\$148.79)	(\$113.62)	(\$98.75)	(\$162.67)	(\$159.47)	(\$94.63)	(\$88.82)
III. CULF BREAK-EVEN PRICE (Variable Costs)		\$45.19	\$56.98	\$58.24	\$58.53	\$62.91	\$59.61	\$46.48	\$48.45
IV. CULF BREAK-EVEN PRICE (Total Costs)		\$88.14	\$104.78	\$83.57	\$85.81	\$104.41	\$99.68	\$79.81	\$83.73
V. INVESTMENT*		\$4,938	\$4,922	\$5,396	\$5,393	\$5,396	\$5,393	\$4,993	\$4,994
ASSET TURNOVER :									
VI. NET (Ln.II.)/INVESTMENT (Ln.V.)		3.09%	-1.01%	-8.42%	-8.14%	-1.33%	-1.27%	-8.07%	8.04%
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln.V.)		9.46%	8.82%	8.78%	8.35%	7.87%	7.82%	9.49%	9.66%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1980

## FACTORS THAT VARY BY CALVING SEASON ##		SPRING		FALL		FALL		FALL FESCUE	
UNIT	PRICE	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
)))))))))))))== (Amounts are units per head per year)									
I. COW UNIT FEED COSTS									
A. Native Range AC	\$12.90	8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5
B. Fescue Pasture** AC	\$26.56	8.0	8.0	8.0	8.0	8.0	8.0	1.5	1.5
C. Alfalfa Hay TONS	\$50.88	0.84	0.53	1.06	0.81	1.06	0.81	0.19	0.23
D. SBM 44% TONS	\$240.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00
E. Mineral & Salt CWT	\$5.11	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain BU	\$2.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Gross Hay TONS	\$44.63	0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert. AC	\$19.83	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$28.55	\$28.55
II. LABOR	\$3.70	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
III. REVENUE FACTORS	BORN : WEANED:	FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
A. Steer Price/Cwt at Weaning		\$78.63	\$81.53	\$76.47	\$82.48	\$82.75	\$77.12	\$76.47	\$82.48
B. Steer Weight		550	483	578	546	464	481	578	546
C. Heifer Price/Cwt at Weaning		\$67.28	\$70.66	\$67.16	\$70.09	\$67.23	\$68.12	\$67.16	\$70.09
D. Heifer Weight		521	380	545	515	438	453	545	515
E. Days of Age at Sale		245	184	273	274	212	227	273	274
F. Cull Cow Price/Cwt.		\$45.73	\$45.73	\$44.98	\$48.89	\$44.09	\$43.27	\$44.98	\$48.89
VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) **									
I. OTHER VARIABLE COSTS									
A. Utilities, Fuel & Oil	\$12.58								
B. Vet. & Drugs	\$4.56								
C. Marketing & Breeding	\$5.79								
D. Repairs, Tools & Supplies	\$10.82								
E. Auto Expense	\$2.41								
F. Misc.	\$3.34								
G. Implants	\$1.00								
II. BUILDINGS & EQUIPMENT									
A. Investment	\$357								
B. Life	10								
C. % Tax & Insurance for Bldg/Equip, Livestk	1.8%								
III. INTEREST RATES									
A. Operating Rate----- (%)	14.4%								
B. Fixed Funds Rate----- (%)	11.54%								
IV. NATIVE RANGE VALUE/ACRE		\$463							
V. FESCUE PASTURE VALUE/ACRE		\$664							

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf lbs Produced/Cow: assuming a 90% calf crop = (45% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 30% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced

\*\* The values in section VI. BREEDING HERD, are generally regarded as industry averages and are held constant throughout the analysis. Bull and cow values are estimates which are consistent with Kansas State University Farm Management Guide (MF-266)

## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET

1979

*** COSTS ***		BORN :		SPRING		FALL		FALL		FALL FESCUE	
		WEANED:		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
		AGE IN DAYS:		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
I. TOTAL VARIABLE COSTS											
A. Total Feed Costs				245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs											
a. Native Range				\$108.00	\$108.00	\$121.60	\$121.60	\$121.60	\$121.60	\$83.20	\$83.20
b. Fescue Pasture (rent & fert./AC)				\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$59.79	\$59.79
c. Alfalfa Hay				\$36.31	\$22.86	\$45.73	\$34.86	\$45.73	\$34.86	\$8.34	\$18.11
d. SBM 44s				\$0.00	\$0.00	\$0.00	\$6.79	\$0.00	\$6.79	\$0.00	\$0.00
e. Mineral & Salt				\$2.53	\$2.53	\$2.53	\$2.53	\$2.53	\$2.53	\$2.53	\$2.53
f. Grain				\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
g. Grass Hay				\$7.43	\$7.43	\$8.38	\$8.38	\$8.38	\$8.38	\$5.51	\$6.84
Total Cow Unit Feed Costs				\$155.07	\$141.61	\$178.23	\$174.15	\$178.23	\$174.15	\$159.37	\$161.66
2. Bull & Replace. Feed Costs/C-C unit				\$42.56	\$42.56	\$42.56	\$42.56	\$42.56	\$42.56	\$42.56	\$42.56
Total Feed Costs				\$197.63	\$184.17	\$220.79	\$216.71	\$220.79	\$216.71	\$201.93	\$204.23
B. Labor				\$21.00	\$21.00	\$28.00	\$28.00	\$28.00	\$28.00	\$28.00	\$28.00
C. Other Variable Costs (Held Constant)				\$35.97	\$35.97	\$35.97	\$35.97	\$35.97	\$35.97	\$35.97	\$35.97
D. Interest (= Half of VC x int. rate)				\$15.63	\$14.81	\$17.48	\$17.23	\$17.48	\$17.23	\$16.33	\$16.47
TOTAL VARIABLE COSTS				\$270.23	\$255.55	\$302.24	\$297.91	\$302.24	\$297.91	\$282.23	\$284.66
II. TOTAL FIXED COSTS (Held Constant)				\$147.39	\$147.39	\$147.39	\$147.39	\$147.39	\$147.39	\$147.39	\$147.39
III. TOTAL COSTS (TVC+TFC)				\$417.62	\$403.34	\$449.63	\$445.30	\$449.63	\$445.30	\$429.62	\$432.05
*** RETURNS ***		BORN :		FEB-MAR		APR-MAY		SEP-OCT		NOV-DEC	
		WEANED:		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
		AGE IN DAYS:		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer Wean Weight				550	483	578	546	464	481	578	546
B. Heifer Wean Weight				521	380	545	515	438	453	545	515
C. Calf Lbs Produced/Cow				482	352	585	477	406	428	585	477
II. PRICES											
A. Steer Price/Cwt at Weaning				\$86.41	\$92.11	\$87.76	\$94.54	\$109.23	\$98.72	\$87.76	\$94.54
B. Heifer Price/Cwt at Weaning				\$75.88	\$80.78	\$80.18	\$79.19	\$92.38	\$83.52	\$80.18	\$79.19
C. Cull Cow Price/Cwt				\$47.12	\$47.12	\$53.18	\$49.74	\$58.76	\$58.12	\$53.18	\$49.74
III. REVENUE											
A. Steer Revenue (\$)				\$213.86	\$167.04	\$228.26	\$232.28	\$228.07	\$213.68	\$228.26	\$232.28
B. Heifer Revenue (\$)				\$117.35	\$92.89	\$131.89	\$122.35	\$121.39	\$113.58	\$131.89	\$122.35
C. Cull Cow Revenue (\$)				\$77.75	\$77.75	\$87.62	\$82.07	\$96.95	\$82.70	\$87.62	\$82.07
TOTAL REVENUE				\$408.96	\$336.88	\$446.97	\$436.70	\$446.41	\$409.88	\$446.97	\$436.70
*** ANALYSIS ***											
I. REVENUE-VARIABLE COSTS				\$138.73	\$80.93	\$144.73	\$138.79	\$144.17	\$111.97	\$164.74	\$152.04
II. REVENUE-TOTAL COST				(\$8.66)	(\$66.46)	(\$2.66)	(\$8.68)	(\$3.22)	(\$35.42)	\$17.36	\$4.65
III. CULF BREAK-EVEN PRICE (Variable Costs)				\$39.94	\$50.58	\$42.47	\$45.21	\$50.58	\$51.21	\$38.51	\$42.43
IV. CULF BREAK-EVEN PRICE (Total Costs)				\$70.52	\$92.40	\$71.64	\$76.08	\$86.89	\$86.27	\$67.68	\$73.38
V. INVESTMENT*				\$4,437	\$4,431	\$4,852	\$4,858	\$4,852	\$4,850	\$4,445	\$4,447
ASSET TURNOVER :											
VI. NET (Ln. II.)/INVESTMENT (Ln. V.)				1.58%	0.20%	1.58%	1.38%	1.49%	0.83%	2.89%	1.88%
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln. V.)				10.92%	9.31%	10.77%	10.56%	10.76%	10.01%	11.75%	11.52%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1979

** FACTORS THAT VARY BY CALVING SEASON **		SPRING		FALL		FALL		FALL FESCUE	
UNIT	PRICE	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
))))))))))= (Amounts are units per head per year)									
I. COW UNIT FEED COSTS									
A. Native Range AC	\$12.00	8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5
B. Fescue Pasture* AC	\$22.24	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5
C. Alfalfa Hay TONS	\$43.06	0.04	0.53	1.06	0.81	1.06	0.81	0.19	0.23
D. SBM 44% TONS	\$230.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00
E. Mineral & Salt CWT	\$4.43	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain BU	\$2.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Grass Hay TONS	\$39.75	0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert. AC	\$17.62	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$26.43	\$26.43
II. LABOR	\$3.50	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
III. REVENUE FACTORS	BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer Price/Cwt at Weaning		\$86.41	\$92.11	\$87.76	\$94.54	\$109.23	\$98.72	\$87.76	\$94.54
B. Steer Weight		550	403	578	546	464	481	578	546
C. Heifer Price/Cwt at Weaning		\$75.08	\$80.78	\$80.18	\$79.19	\$92.38	\$83.52	\$80.18	\$79.19
D. Heifer Weight		521	380	545	515	438	453	545	515
E. Days of Age at Sale		245	184	273	274	212	227	273	274
F. Cull Cow Price/Cwt.		\$47.12	\$47.12	\$53.18	\$49.74	\$58.76	\$50.12	\$53.18	\$49.74
** FACTORS HELD CONSTANT BY CALVING SEASON **		VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) **							
I. OTHER VARIABLE COSTS		A. % Calf Crop 90							
A. Utilities, Fuel & Oil	\$9.49	B. % Steers Weaned for Sale 45							
B. Vet. & Drugs	\$5.29	C. % Heifers Weaned for Sale 30							
C. Marketing & Breeding	\$5.30	D. % Heifers Weaned for Herd Replacement 15							
D. Repairs, Tools & Supplies	\$11.06	E. % Bull per Cow 4							
E. Auto Expense	\$1.53	F. Average Cow Value \$550							
F. Misc.	\$2.31	G. Average Bull Value \$1,500							
G. Implants	\$1.00	H. Cow Life 8							
II. BUILDINGS & EQUIPMENT		I. Bull Life 3							
A. Investment	\$307	J. Salvage Value/Cow \$400							
B. Life	10	K. Salvage Value/Bull \$500							
C. % Tax & Insurance for Bldg/Equip, Livestk	1.0%	L. Cull Cow Weight 1100							
III. INTEREST RATES		** The values in section VI, BREEDING HERD, are							
A. Operating Rate----- (%)	12.28%	generally regarded as industry averages and are held							
B. Fixed Funds Rate----- (%)	9.98%	constant throughout the analysis. Bull and cow values							
		are estimates which are consistent with Kansas State							
IV. NATIVE RANGE VALUE/ACRE		University Farm Management Guide (MF-256)							
V. FESCUE PASTURE VALUE/ACRE									

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf Lbs Produced/Cow: assuming a 90% calf crop = (45% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 30% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced



\*\*\* CALVING SEASON STRATEGIES \*\*\*  
BEEF COWHERO COST-RETURN BUDGET

1978

*** COSTS ***	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
I. TOTAL VARIABLE COSTS									
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$94.35	\$94.35	\$105.45	\$105.45	\$105.45	\$105.45	\$72.15	\$72.15
b. Fescue Pasture (rent & fert./AC)		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$56.43	\$56.43
c. Alfalfa Hay		\$38.27	\$24.89	\$48.19	\$36.74	\$48.19	\$36.74	\$8.79	\$18.65
d. SBM 44s		\$0.00	\$0.00	\$0.00	\$6.20	\$0.00	\$6.20	\$0.00	\$0.00
e. Mineral & Salt		\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39	\$2.39
f. Grain		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
g. Grass Hay		\$7.65	\$7.65	\$8.63	\$8.63	\$8.63	\$8.63	\$5.68	\$6.22
Total Cow Unit Feed Costs		\$142.66	\$128.48	\$164.66	\$159.40	\$164.66	\$159.40	\$145.44	\$147.85
2. Bull & Replace. Feed Costs/C-C unit		\$41.02	\$41.02	\$41.02	\$41.02	\$41.02	\$41.02	\$41.02	\$41.02
Total Feed Costs		\$183.68	\$169.50	\$205.68	\$200.42	\$205.68	\$200.42	\$186.46	\$188.87
B. Labor		\$17.46	\$17.46	\$23.28	\$23.28	\$23.28	\$23.28	\$23.28	\$23.28
C. Other Variable Costs (Held Constant)		\$29.57	\$29.57	\$29.57	\$29.57	\$29.57	\$29.57	\$29.57	\$29.57
D. Interest (= Half of VC x int. rate)		\$13.36	\$12.54	\$14.97	\$14.66	\$14.97	\$14.66	\$13.86	\$14.00
TOTAL VARIABLE COSTS		\$244.07	\$229.07	\$273.58	\$267.94	\$273.58	\$267.94	\$253.17	\$255.71
II. TOTAL FIXED COSTS (Held Constant)		\$134.19	\$134.19	\$134.19	\$134.19	\$134.19	\$134.19	\$134.19	\$134.19
III. TOTAL COSTS (TVC+TFC)		\$378.26	\$363.26	\$407.69	\$402.13	\$407.69	\$402.13	\$387.36	\$389.90
*** RETURNS ***									
	BORN : WEANED:	FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
A. Steer Wean Weight		550	403	578	546	464	481	578	546
B. Heifer Wean Weight		521	380	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	505	477	406	420	505	477
II. PRICES									
A. Steer Price/Cwt at Weaning		\$67.73	\$71.33	\$62.30	\$68.39	\$63.48	\$68.42	\$62.30	\$68.39
B. Heifer Price/Cwt at Weaning		\$58.68	\$62.84	\$53.43	\$59.43	\$52.96	\$58.48	\$53.43	\$59.43
C. Cull Cow Price/Cwt		\$40.24	\$40.24	\$39.85	\$39.13	\$39.19	\$38.91	\$39.85	\$39.13
III. REVENUE									
A. Steer Revenue (\$)		\$167.63	\$129.36	\$162.84	\$168.83	\$132.55	\$148.10	\$162.84	\$168.83
B. Heifer Revenue (\$)		\$91.59	\$71.64	\$87.36	\$91.82	\$69.59	\$73.47	\$87.36	\$91.82
C. Cull Cow Revenue (\$)		\$66.40	\$66.40	\$64.43	\$64.56	\$64.66	\$64.20	\$64.43	\$64.56
TOTAL REVENUE		\$325.62	\$267.39	\$313.83	\$324.42	\$266.80	\$291.77	\$313.83	\$324.42
*** ANALYSIS ***									
I. REVENUE-VARIABLE COSTS		\$81.55	\$38.32	\$40.34	\$56.48	(\$7.78)	\$23.83	\$60.67	\$68.71
II. REVENUE-TOTAL COST		(\$52.64)	(\$95.87)	(\$93.85)	(\$77.71)	(\$140.89)	(\$110.36)	(\$73.52)	(\$65.48)
III. CALF BREAK-EVEN PRICE (Variable Costs)		\$36.87	\$46.17	\$41.37	\$42.60	\$51.45	\$48.47	\$37.35	\$40.83
IV. CALF BREAK-EVEN PRICE (Total Costs)		\$64.71	\$84.25	\$67.92	\$78.78	\$84.51	\$80.40	\$63.98	\$68.14
V. INVESTMENT*		\$3,999	\$3,892	\$4,256	\$4,253	\$4,256	\$4,253	\$3,938	\$3,939
ASSET TURNOVER :									
VI. NET (Ln. II.)/INVESTMENT (Ln. V.)		0.38%	-0.73%	-0.62%	-0.24%	-1.72%	-1.01%	-0.15%	0.85%
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln. V.)		10.88%	8.61%	8.96%	9.22%	7.86%	8.45%	9.69%	9.95%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.



## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET

1977

*** COSTS ***	BORN : WEANED: AGE IN DAYS:	SPRING		FALL		FALL		FALL FESCUE	
		FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
I. TOTAL VARIABLE COSTS									
A. Total Feed Costs		245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs									
a. Native Range		\$98.95	\$98.95	\$101.65	\$101.65	\$101.65	\$101.65	\$69.55	\$69.55
b. Fescue Pasture (rent & fert./AC)		\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$54.68	\$54.68
c. Alfalfa Hay		\$45.49	\$28.63	\$57.28	\$43.67	\$57.28	\$43.67	\$18.45	\$12.66
d. SBM 44%		\$8.00	\$8.00	\$8.00	\$7.08	\$8.00	\$7.08	\$8.00	\$8.00
e. Mineral & Salt		\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25	\$2.25
f. Grain		\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00
g. Grass Hay		\$9.53	\$9.53	\$18.75	\$18.75	\$18.75	\$18.75	\$7.08	\$7.75
Total Cow Unit Feed Costs		\$148.22	\$131.36	\$171.92	\$165.39	\$171.92	\$165.39	\$143.99	\$146.88
2. Bull & Replace. Feed Costs/C-C unit		\$45.77	\$45.77	\$45.77	\$45.77	\$45.77	\$45.77	\$45.77	\$45.77
Total Feed Costs		\$193.99	\$177.13	\$217.69	\$211.16	\$217.69	\$211.16	\$189.76	\$192.65
B. Labor		\$15.60	\$15.60	\$20.80	\$20.80	\$20.80	\$20.80	\$20.80	\$20.80
C. Other Variable Costs (Held Constant)		\$28.09	\$28.09	\$28.09	\$28.09	\$28.09	\$28.09	\$28.09	\$28.09
D. Interest (= Half of VC x int. rate)		\$13.76	\$12.79	\$15.44	\$15.06	\$15.44	\$15.86	\$13.82	\$13.99
TOTAL VARIABLE COSTS		\$251.44	\$233.61	\$282.02	\$275.11	\$282.02	\$275.11	\$252.47	\$255.53
II. TOTAL FIXED COSTS (Held Constant)		\$129.52	\$129.52	\$129.52	\$129.52	\$129.52	\$129.52	\$129.52	\$129.52
III. TOTAL COSTS (TVC+TFC)		\$380.96	\$363.13	\$411.54	\$404.63	\$411.54	\$404.63	\$381.99	\$385.05
*** RETURNS ***									
	BORN : WEANED:	FEB-MAR NOV 1	APR-MAY NOV 1	SEP-OCT JUL 1	NOV-DEC SEP 1	SEP-OCT MAY 1	NOV-DEC JUL 15	SEP-OCT JUL 1	NOV-DEC SEP 1
A. Steer Mean Weight		508	483	578	546	464	481	578	546
B. Heifer Mean Weight		521	388	545	515	438	453	545	515
C. Calf Lbs Produced/Cow		482	352	585	477	486	428	585	477
II. PRICES									
A. Steer Price/Cwt at Weaning		\$41.56	\$43.87	\$41.24	\$44.16	\$45.97	\$43.14	\$41.24	\$44.16
B. Heifer Price/Cwt at Weaning		\$35.49	\$34.96	\$36.13	\$37.52	\$36.87	\$36.62	\$36.13	\$37.52
C. Cull Cow Price/Cwt		\$24.29	\$24.29	\$25.99	\$26.34	\$28.35	\$26.19	\$25.99	\$26.34
III. REVENUE									
A. Steer Revenue (\$)		\$182.86	\$78.11	\$187.27	\$186.58	\$95.99	\$93.38	\$187.27	\$186.58
B. Heifer Revenue (\$)		\$35.47	\$39.85	\$59.87	\$57.97	\$48.45	\$49.77	\$59.87	\$57.97
C. Cull Cow Revenue (\$)		\$48.88	\$48.88	\$44.53	\$43.46	\$46.78	\$43.21	\$44.53	\$43.46
TOTAL REVENUE		\$167.21	\$166.84	\$291.67	\$288.01	\$191.22	\$192.46	\$291.67	\$288.01
*** ANALYSIS ***									
I. REVENUE-VARIABLE COSTS		(\$53.83)	(\$75.56)	(\$71.15)	(\$65.16)	(\$98.81)	(\$88.75)	(\$41.68)	(\$45.68)
II. REVENUE-TOTAL COST		(\$182.55)	(\$205.89)	(\$208.67)	(\$194.78)	(\$220.33)	(\$212.27)	(\$171.12)	(\$175.12)
III. CALF BREAK-EVEN PRICE (Variable Costs)		\$43.85	\$54.98	\$46.99	\$48.52	\$57.95	\$55.17	\$41.15	\$44.42
IV. CALF BREAK-EVEN PRICE (Total Costs)		\$78.73	\$91.68	\$72.62	\$75.65	\$89.86	\$85.99	\$66.78	\$71.54
V. INVESTMENT*		\$3,714	\$3,786	\$4,853	\$4,850	\$4,853	\$4,850	\$3,732	\$3,733
ASSET TURNOVER :									
VI. NET (Ln. II.)/(INVESTMENT (Ln. V.))		-3.13%	-3.75%	-3.32%	-3.17%	-3.88%	-3.76%	-2.81%	-2.92%
VII. GROSS (Tot. Rev.)/(INVESTMENT (Ln. V.))		7.12%	6.85%	6.83%	6.82%	6.35%	6.23%	7.42%	7.48%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1977

** FACTORS THAT VARY BY CALVING SEASON **		SPRING		FALL		FALL		FALL FESCUE	
UNIT	PRICE	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
))))))))))))))))))))))==(Amounts are units per head per year)									
I. COW UNIT FEED COSTS									
A. Native Range AC	\$18.78	8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5
B. Fescue Pasture+ AC	\$18.48	8.0	8.0	8.8	8.8	8.8	8.8	1.5	1.5
C. Alfalfa Hay TONS	\$53.94	0.84	0.53	1.06	0.81	1.06	0.81	0.19	0.23
D. SBM 44s TONS	\$240.88	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00
E. Mineral & Salt CMT	\$3.94	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain BU	\$1.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Grass Hay TONS	\$51.81	0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert. AC	\$17.97	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$26.96	\$26.96
II. LABOR	\$2.68	6.0	5.0	8.0	8.0	8.0	8.0	8.0	8.0
III. REVENUE FACTORS		BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT
	WEANED:	NOV 1	NOV 1	NOV 1	SEP 1	SEP 1	MAY 1	JUL 15	JUL 1
A. Steer Price/Cwt at Weaning		\$41.56	\$43.87	\$41.24	\$44.16	\$45.97	\$43.14	\$41.24	\$44.16
B. Steer Weight		558	483	578	546	464	481	578	546
C. Heifer Price/Cwt at Weaning		\$35.49	\$34.96	\$36.13	\$37.52	\$36.87	\$36.62	\$36.13	\$37.52
D. Heifer Weight		521	388	545	515	438	453	545	515
E. Days of Age at Sale		245	184	273	274	212	227	273	274
F. Cull Cow Price/Cwt.		\$24.29	\$24.29	\$26.99	\$26.34	\$28.35	\$26.19	\$26.99	\$26.34
** FACTORS HELD CONSTANT BY CALVING SEASON **		VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) **							
I. OTHER VARIABLE COSTS									
A. Utilities, Fuel & Oil	\$7.28								
B. Vet. & Drugs	\$3.93								
C. Marketing & Breeding	\$4.17								
D. Repairs, Tools & Supplies	\$8.89								
E. Auto Expense	\$1.83								
F. Misc.	\$1.79								
G. Implants	\$1.08								
II. BUILDINGS & EQUIPMENT									
A. Investment	\$229								
B. Life	18								
C. X Tax & Insurance for Bldg/Eqp, Livstk	1.0%								
III. INTEREST RATES									
A. Operating Rate----- (X)	11.58%								
B. Fixed Funds Rate----- (X)	9.13%								
IV. NATIVE RANGE VALUE/ACRE									
V. FESCUE PASTURE VALUE/ACRE	\$462								

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf Lbs Produced/Cows assuming a 98% calf crop = (45% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 38% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced

\*\* The values in section VI. BREEDING HERD, are generally regarded as industry averages and are held constant throughout the analysis. Bull and cow values are estimates which are consistent with Kansas State University Farm Management Guide (MF-266)

## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET 1976

*** COSTS ***		BORN :		SPRING		FALL		FALL		FALL		FALL	
		WEANED:		FEB-MAR		APR-MAY		SEP-OCT		NOV-DEC		SEP-OCT	
I. TOTAL VARIABLE COSTS		AGE IN DAYS:		NOV 1		NOV 1		JUL 1		SEP 1		JUL 1	
A. Total Feed Costs				245		184		273		274		212	
1. Cow Unit Feed Costs													
a. Native Range				\$92.65		\$92.65		\$183.55		\$183.55		\$183.55	
b. Fescue Pasture (rent & fert./AC)				\$8.00		\$8.00		\$8.00		\$8.00		\$8.00	
c. Alfalfa Hay				\$48.69		\$25.61		\$51.24		\$39.86		\$51.24	
d. SSM 44x				\$8.00		\$8.00		\$8.00		\$5.02		\$8.00	
e. Mineral & Salt				\$2.14		\$2.14		\$2.14		\$2.14		\$2.14	
f. Grain				\$8.00		\$8.00		\$8.00		\$8.00		\$8.00	
g. Brass Hay				\$8.28		\$8.28		\$9.24		\$9.24		\$9.24	
Total Cow Unit Feed Costs				\$143.67		\$128.68		\$166.17		\$159.81		\$166.17	
2. Bull & Replace. Feed Costs/C-C unit				\$42.27		\$42.27		\$42.27		\$42.27		\$42.27	
Total Feed Costs				\$185.94		\$170.87		\$208.43		\$201.28		\$208.43	
B. Labor				\$16.56		\$16.56		\$22.08		\$22.08		\$22.08	
C. Other Variable Costs (Held Constant)				\$27.16		\$27.16		\$27.16		\$27.16		\$27.16	
D. Interest (= Half of VC x int. rate)				\$13.44		\$12.55		\$15.87		\$14.66		\$15.87	
TOTAL VARIABLE COSTS				\$243.18		\$227.14		\$272.75		\$265.17		\$272.75	
II. TOTAL FIXED COSTS (Held Constant)				\$127.11		\$127.11		\$127.11		\$127.11		\$127.11	
III. TOTAL COSTS (TVC+TFC)				\$370.21		\$354.25		\$399.86		\$392.28		\$399.86	
*** RETURNS ***		BORN :		FEB-MAR		APR-MAY		SEP-OCT		NOV-DEC		SEP-OCT	
		WEANED:		NOV 1		NOV 1		JUL 1		SEP 1		JUL 1	
A. Steer Mean Weight				558		483		578		546		464	
B. Heifer Mean Weight				521		388		545		515		438	
C. Calf Lbs Produced/Cow				482		352		585		477		485	
II. PRICES													
A. Steer Price/Cwt at Weaning				\$37.89		\$39.33		\$40.46		\$39.95		\$47.57	
B. Heifer Price/Cwt at Weaning				\$38.99		\$38.68		\$34.98		\$34.56		\$38.84	
C. Cull Cow Price/Cwt				\$21.38		\$21.38		\$28.81		\$23.84		\$31.69	
III. REVENUE													
A. Steer Revenue (\$)				\$93.78		\$71.32		\$185.24		\$98.18		\$99.33	
B. Heifer Revenue (\$)				\$48.44		\$34.88		\$57.86		\$53.48		\$51.84	
C. Cull Cow Revenue (\$)				\$35.15		\$35.15		\$46.22		\$39.34		\$52.29	
TOTAL REVENUE				\$177.36		\$141.35		\$288.51		\$198.91		\$282.65	
*** ANALYSIS ***													
I. REVENUE-VARIABLE COSTS				(\$65.74)		(\$85.78)		(\$64.23)		(\$74.25)		(\$78.18)	
II. REVENUE-TOTAL COST				(\$192.85)		(\$212.89)		(\$191.34)		(\$201.37)		(\$197.21)	
III. CALF BREAK-EVEN PRICE (Variable Costs)				\$43.15		\$54.49		\$44.83		\$47.38		\$54.31	
IV. CALF BREAK-EVEN PRICE (Total Costs)				\$69.52		\$98.56		\$69.98		\$73.92		\$85.63	
V. INVESTMENT*				\$3,475		\$3,468		\$3,788		\$3,785		\$3,788	
ASSET TURNOVER :													
VI. NET (Ln. II.)/INVESTMENT (Ln. V.)				-3.65%		-4.23%		-3.31%		-3.58%		-3.46%	
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln. V.)				7.88%		5.98%		7.25%		6.79%		7.89%	

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1976

## FACTORS THAT VARY BY CALVING SEASON ##		SPRING		FALL		FALL		FALL FESCUE	
UNIT	PRICE	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
))))))))))))))))))))))=((Amounts are units per head per year))									
<b>I. COW UNIT FEED COSTS</b>									
A. Native Range AC	\$10.90	8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5
B. Fescue Pasture* AC	\$17.16	8.8	8.8	8.8	8.8	8.8	8.8	1.5	1.5
C. Alfalfa Hay TONS	\$48.25	8.84	8.53	1.06	0.81	1.06	0.81	0.19	0.23
D. SBM 44% TONS	\$170.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00
E. Mineral & Salt CMT	\$3.75	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
F. Grain BU	\$1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Grass Hay TONS	\$43.86	0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15
H. Fescue Fert. AC	\$21.85	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$32.78	\$32.79
II. LABOR	\$2.76	6.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0
<b>III. REVENUE FACTORS</b>		BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT
WEANED:		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
<b>VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) **</b>									
A. Steer Price/Cwt at Weaning	\$37.89	\$39.33	\$40.46	\$39.96	\$47.57	\$40.64	\$40.46	\$39.96	
B. Steer Weight	550	483	579	546	464	481	579	546	
C. Heifer Price/Cwt at Weaning	\$38.99	\$38.60	\$34.90	\$34.56	\$38.84	\$34.48	\$34.90	\$34.56	
D. Heifer Weight	521	390	545	515	438	453	545	515	
E. Days of Age at Sale	245	184	273	274	212	227	273	274	
F. Cull Cow Price/Cwt.	\$21.38	\$21.38	\$28.01	\$23.84	\$31.69	\$26.87	\$28.01	\$23.84	
<b>I. OTHER VARIABLE COSTS</b>									
A. Utilities, Fuel & Oil	\$6.97								
B. Vet. & Drugs	\$4.01								
C. Marketing & Breeding	\$3.51								
D. Repairs, Tools & Supplies	\$7.83								
E. Auto Expense	\$1.92								
F. Misc.	\$1.92								
G. Implants	\$1.00								
<b>II. BUILDINGS &amp; EQUIPMENT</b>									
A. Investment	\$208								
B. Life	10								
C. % Tax & Insurance for Bldg/Exp, Livestk	1.0%								
<b>III. INTEREST RATES</b>									
A. Operating Rate----- (%)	11.70%								
B. Fixed Funds Rate----- (%)	9.25%								
<b>IV. NATIVE RANGE VALUE/ACRE</b>									
V. FESCUE PASTURE VALUE/ACRE	\$429								

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf Lbs Produced/Cow: assuming a 98% calf crop = (45% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 38% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced

\*\* The values in section VI. BREEDING HERD, are generally regarded as industry averages and are held constant throughout the analysis. Bull and cow values are estimates which are consistent with Kansas State University Farm Management Guide (MF-266)

## \*\*\* CALVING SEASON STRATEGIES \*\*\*

## BEEF COWHERD COST-RETURN BUDGET

1975

*** COSTS ***		BORN :		SPRING		FALL		FALL		FALL FESCUE	
		WEANED:		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
I. TOTAL VARIABLE COSTS		AGE IN DAYS:		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Total Feed Costs				245	184	273	274	212	227	273	274
1. Cow Unit Feed Costs											
a. Native Range				\$89.25	\$89.25	\$99.75	\$99.75	\$99.75	\$99.75	\$68.25	\$68.25
b. Fescue Pasture (rent & fert./AC)				\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$54.85	\$54.85
c. Alfalfa Hay				\$48.74	\$25.64	\$51.38	\$39.11	\$51.38	\$39.11	\$9.36	\$11.34
d. SBM 44%				\$8.00	\$8.00	\$8.00	\$5.72	\$8.00	\$5.72	\$8.00	\$8.00
e. Mineral & Salt				\$2.83	\$2.83	\$2.83	\$2.83	\$2.83	\$2.83	\$2.83	\$2.83
f. Grain				\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00	\$8.00
g. Brass Hay				\$8.67	\$8.67	\$9.77	\$9.77	\$9.77	\$9.77	\$6.43	\$7.85
Total Cow Unit Feed Costs				\$148.59	\$125.59	\$162.85	\$126.39	\$162.85	\$126.39	\$148.11	\$142.71
2. Bull & Replace. Feed Costs/C-C unit				\$43.43	\$43.43	\$43.43	\$43.43	\$43.43	\$43.43	\$43.43	\$43.43
Total Feed Costs				\$184.12	\$169.02	\$206.29	\$199.82	\$206.29	\$199.82	\$183.35	\$186.15
B. Labor				\$15.18	\$15.18	\$28.24	\$28.24	\$28.24	\$28.24	\$28.24	\$28.24
C. Other Variable Costs (Held Constant)				\$25.87	\$25.87	\$25.87	\$25.87	\$25.87	\$25.87	\$25.87	\$25.87
D. Interest (= Half of VC x int. rate)				\$13.17	\$12.29	\$14.77	\$14.39	\$14.77	\$14.39	\$13.44	\$13.59
TOTAL VARIABLE COSTS				\$238.34	\$222.36	\$267.16	\$268.32	\$267.16	\$268.32	\$243.89	\$245.84
II. TOTAL FIXED COSTS (Held Constant)				\$126.80	\$126.80	\$126.80	\$126.80	\$126.80	\$126.80	\$126.80	\$126.80
III. TOTAL COSTS (TVC+FFC)				\$365.14	\$349.16	\$393.96	\$395.11	\$393.96	\$395.11	\$369.89	\$372.64
*** RETURNS ***		BORN :		SPRING		FALL		FALL		FALL FESCUE	
		WEANED:		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
		AGE IN DAYS:		NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
A. Steer Wean Weight				558	483	578	546	464	481	578	546
B. Heifer Wean Weight				521	388	545	515	438	453	545	515
C. Calf Lbs Produced/Cow				482	352	585	477	406	428	585	477
II. PRICES											
A. Steer Price/Cwt at Weaning				\$37.34	\$35.67	\$35.17	\$34.89	\$33.25	\$32.58	\$35.17	\$34.89
B. Heifer Price/Cwt at Weaning				\$28.99	\$24.65	\$29.25	\$28.93	\$25.68	\$26.64	\$29.25	\$28.93
C. Cull Cow Price/Cwt				\$21.44	\$21.44	\$23.88	\$22.17	\$23.83	\$21.69	\$23.88	\$22.17
III. REVENUE											
A. Steer Revenue (\$)				\$92.42	\$64.69	\$91.48	\$85.72	\$69.43	\$78.52	\$91.48	\$85.72
B. Heifer Revenue (\$)				\$45.31	\$28.18	\$47.82	\$44.78	\$33.64	\$36.28	\$47.82	\$44.78
C. Cull Cow Revenue (\$)				\$35.38	\$35.38	\$38.88	\$36.58	\$38.88	\$35.79	\$38.88	\$36.58
TOTAL REVENUE				\$173.10	\$128.16	\$177.38	\$167.08	\$141.95	\$142.51	\$177.38	\$167.08
*** ANALYSIS ***											
I. REVENUE-VARIABLE COSTS				(\$65.24)	(\$94.20)	(\$89.78)	(\$93.32)	(\$126.18)	(\$117.81)	(\$65.71)	(\$76.84)
II. REVENUE-TOTAL COST				(\$192.04)	(\$221.00)	(\$216.57)	(\$228.11)	(\$252.89)	(\$244.60)	(\$192.51)	(\$205.64)
III. Calf Break-even Price (Variable Costs)				\$42.11	\$53.87	\$45.33	\$46.86	\$56.46	\$53.42	\$48.57	\$43.83
IV. Calf Break-even Price (Total Costs)				\$68.42	\$89.85	\$78.42	\$73.42	\$87.78	\$83.59	\$65.66	\$78.39
V. INVESTMENT*				\$3,228	\$3,228	\$3,512	\$3,589	\$3,512	\$3,589	\$3,381	\$3,382
ASSET TURNOVER :											
VI. NET (Ln. II.)/INVESTMENT (Ln. V.)				-3.91%	-4.81%	-4.29%	-4.39%	-5.32%	-5.09%	-3.83%	-4.23%
VII. GROSS (Tot. Rev.)/INVESTMENT (Ln. V.)				7.41%	6.83%	6.93%	6.64%	5.89%	5.94%	7.37%	7.85%

\* Investment is the maximum at one time assuming 1/2 the operating costs (less interest), value of the cow, share of bull, value of buildings and equipment, and value of grass.

## ((( FACTORS USED TO CALCULATE BUDGETS ))) 1975

## FACTORS THAT VARY BY CALVING SEASON ##				SPRING		FALL		FALL		FALL FESCUE			
UNIT		PRICE		FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC		
))))))))))))))))))))))=((Amounts are units per head per year))													
I. COW UNIT FEED COSTS													
A. Native Range	AC	\$18.58		8.5	8.5	9.5	9.5	9.5	9.5	6.5	6.5		
B. Fescue Pasture*	AC	\$17.00		8.8	8.8	8.8	8.8	8.8	8.8	1.5	1.5		
C. Alfalfa Hay	TONS	\$48.31		0.84	0.53	1.06	0.81	1.06	0.81	0.19	0.23		
D. SBM 44%	TONS	\$194.88		0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.00		
E. Mineral & Salt	CWT	\$3.56		0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57		
F. Grain	BU	\$2.27		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G. Grass Hay	TONS	\$46.38		0.19	0.19	0.21	0.21	0.21	0.21	0.14	0.15		
H. Fescue Fert.	AC	\$19.83		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$28.55	\$28.55		
II. LABOR		\$2.53		5.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0		
III. REVENUE FACTORS				BORN :	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	
				WEANED:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1	
A. Steer Price/Cwt at Weaning					\$37.34	\$35.67	\$35.17	\$34.89	\$33.25	\$32.58	\$35.17	\$34.89	
B. Steer Weight					558	483	578	546	464	481	578	546	
C. Heifer Price/Cwt at Weaning					\$28.99	\$24.65	\$29.25	\$28.93	\$25.68	\$26.64	\$29.25	\$28.93	
D. Heifer Weight					521	388	545	515	438	453	545	515	
E. Days of Age at Sale					245	184	273	274	212	227	273	274	
F. Cull Cow Price/Cwt.					\$21.44	\$21.44	\$23.88	\$22.17	\$23.83	\$21.69	\$23.88	\$22.17	
## FACTORS HELD CONSTANT BY CALVING SEASON ##													
I. OTHER VARIABLE COSTS				VI. BREEDING HERD (PER HERD ENTRIES) (CONSTANT) ##									
A. Utilities, Fuel & Oil				A. % Calf Crop								98	
B. Vet. & Drugs				B. % Steers Weaned for Sale								45	
C. Marketing & Breeding				C. % Heifers Weaned for Sale								38	
D. Repairs, Tools & Supplies				D. % Heifers Weaned for Herd Replacement								15	
E. Auto Expense				E. % Bull per Cow								4	
F. Misc.				F. Average Cow Value								\$550	
G. Implants				G. Average Bull Value								\$1,580	
II. BUILDINGS & EQUIPMENT				H. Cow Life								8	
A. Investment				I. Bull Life								3	
B. Life				J. Salvage Value/Cow								\$480	
C. % Tax & Insurance for Bldg/Eqp, Livestk				K. Salvage Value/Bull								\$580	
				L. Cull Cow Weight								1100	
III. INTEREST RATES												** The values in section VI. BREEDING HERD, are generally regarded as industry averages and are held constant throughout the analysis. Bull and cow values are estimates which are consistent with Kansas State University Farm Management Guide (MF-266)	
A. Operating Rate----- (%)				11.78%									
B. Fixed Funds Rate----- (%)				9.25%									
IV. NATIVE RANGE VALUE/ACRE				\$281									
V. FESCUE PASTURE VALUE/ACRE				\$425									

\* Price for Fescue Pasture = Value/Acre x 4% Return/Acre

A range of 3-5% Returns/Acre are considered typical by Kansas Farm Management Associations

NOTE: Some formulas used in the Beef Cowherd Cost-return Budget

(1) Calf Lbs Produced/Cow: assuming a 98% calf crop = (45% x steer lbs) + (45% x heifer lbs)

(2) Steer Revenue = steer weaning wt. x 45% x steer price

(3) Heifer Revenue = heifer weaning wt. x 38% x heifer price

(4) Cull Cow Revenue = cull cow wt. x 15% x cull cow price

(5) Calf Break-even Price (variable costs) = variable costs - cull cow revenue / calf lbs produced

(6) Calf Break-even Price (total costs) = total costs - cull cow revenue / calf lbs produced

\*\* The values in section VI. BREEDING HERD, are generally regarded as industry averages and are held constant throughout the analysis. Bull and cow values are estimates which are consistent with Kansas State University Farm Management Guide (FMF-256)



## APPENDIX 2      FIXED COSTS FOR THE BEEF COWHERD

For a farm operator, fixed costs are those that you will incur even if you do not raise any calves. These costs generally include: depreciation, rent (or a land charge), interest, taxes and insurance.

In the beef cowherd cost-return budget used in this thesis, the rent or land charge for pasture was entered as a cost of feed and not as a fixed cost. The rent/acre of native bluestem range as reported by the Kansas Crop-Livestock Reporting Service was used as the rent charge for native range. It was assumed that this charge represented the approximate return to farmland ownership which has historically ranged from 3-5%.<sup>1</sup> In the case of fescue pasture, reliable data on per acre rents were not available so the average return/acre was used as a proxy value. Multiplying the average value of dryland crop ground in Southeast Kansas by 4%, the average returns/acre for fescue pasture was calculated.<sup>2</sup>

Depreciation, interest, taxes and insurance are all largely dependent upon the amount of capital invested. Capital requirements for livestock, livestock equipment and facilities can vary

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<sup>1</sup>A 3-5% return to farmland is consistent with Kansas Farm Management Association estimates. Kansas Farm Management Assn., Dept. of Agricultural Economics and Cooperative Extension Service, Kansas State University, Manhattan, KS.

<sup>2</sup>It is assumed in this thesis that average quality crop ground was necessary to grow a sufficient stand of fescue as required by the fall fescue calving option specified in the beef cowherd cost-return budget. Southeast Kansas cropland values were selected because it is in the southeast corner of Kansas where fescue pasture is the most prevalent.

greatly from one producer to another. Values representing the estimated investment in breeding stock are listed in Table 6. The 1984 estimated new capital investments for buildings and equipment based on a 100 cow-herd, were adapted from KSU Farm Management Guide MF-266.<sup>3</sup> (see table 7) These fixed costs for both buildings/equipment and breeding livestock were held constant among all calving season management options in order to better illustrate the differences due to cow feed costs and calf revenue.

Fixed costs were calculated as follows:

1. Depreciation/Bldgs. & Equip.: total value/cow unit divided by 10 year average life
2. Interest/Bldgs. & Equip.: total value/cow unit divided by 2 then multiplied by the fixed funds interest rate
3. Taxes & Insurance/Bldgs. & Equip.: total value/cow unit multiplied by 1%<sup>4</sup>
4. Interest/Breeding Stock: value of the cow and share of bull value multiplied by the fixed funds interest rate
5. Taxes and Insurance/Breeding Stock: value of the cow and share of bull value multiplied by 1%
6. Depreciation/Breeding Stock: value of the cow and share of bull value minus their salvage values divided by their useful life

<sup>3</sup>The total investment in buildings and equipment/cow unit in 1984 was indexed back in time to derive cow unit investments for each of the other nine years of the analysis. It was assumed that the value for buildings and equipment corresponded closely with the value of all land in farms. Given that assumption, the yearly values for buildings and equipment were calculated by adjusting the 1984 value by the percentage change in the value of all land in farms for East Central Kansas. For example, the 1983 value of buildings and equipment was derived by dividing the value of all land in farms for 1984 by the value in 1983. The resulting ratio was multiplied by the 1984 value for buildings and equipment to find that value for 1983.

<sup>4</sup>It is assumed that taxes and insurance average approximately 1% of farm asset values. This estimate is consistent with KSU Farm Management Guides, Department of Economics, Kansas State University, Manhattan, KS.

TABLE 6.--Capital investments/cow unit for breeding stock

	cow unit share
Cow and Replacement share	$\$550 \times 100\% = \$550$
Bull	$\$1000 \times 4\% = \$40$
<b>TOTAL INVESTMENT/COW UNIT</b>	<b>\$590</b>

TABLE 7.--Capital investments/cow unit for buildings/equipment  
(100 cow-herd) 1984

<b>Facilities</b>	
Working Corral and Equipment	\$4,000
Holding and Feeding Corral	1,200
Feed Bunks (portable) 50'	1,000
Hay Feeders 50'	500
Shelter 1 pen/20 cows 8' X 10'	2,000
Waterers (2)	<u>600</u>
<b>Total Facilities</b>	<b>\$9,300</b>
<b>Feed Storage (Hay Program)</b>	
Hay Storage 1.6T/hd. @ \$20/T	\$3,200
Bale Handling Equipment	500
Protein Bulk Bin (3T)	300
Grain Bulk Bin (2T)	500
Range Cube Delivery System	<u>300</u>
<b>Total Feed Storage</b>	<b>\$4,800</b>
<b>Machinery and Trucks</b>	
1/2 of Pickup Truck	\$4,000
1/2 of 2 1/2T Truck	5,000
1/3 of Small Tractor	5,000
Manure Loader	1,500
Manure Spreader	1,500
Scraper	<u>500</u>
<b>Total Machinery and Truck</b>	<b>\$17,500</b>
<b>Total Investment/100 cow herd</b>	<b>\$31,600</b>
<b>TOTAL INVESTMENT/COW UNIT</b>	<b>\$316</b>

## APPENDIX 3      INPUTS FOR BEEF COWHERD COST-RETURN BUDGETS

TABLE 8.--Historical prices used in the beef cowherd cost-return budgets

	1984	1983	1982	
1. Native Range	\$12.80	\$12.80	\$12.80	\$/Acre
2. Alfalfa Hay	\$71.00	\$54.86	\$60.13	\$/Ton
3. Soybean Meal	\$300.00	\$240.00	\$250.00	\$/Ton
4. Mineral & Salt	\$5.83	\$5.81	\$5.80	\$/Cwt.
5. Grain	\$2.55	\$2.77	\$2.67	\$/Bu.
6. Grass Hay	\$52.00	\$43.86	\$48.25	\$/Ton
7. Fescue Fertilizer	\$24.14	\$25.37	\$25.37	\$/Acre
8. Labor Wage	\$4.20	\$4.57	\$3.77	\$/Hour
9. Utilities, Fuel, Oil	\$17.37	\$17.21	\$15.38	\$/Year
10. Vet. & Drugs	\$6.92	\$7.25	\$4.71	\$/Year
11. Marketing & Breeding	\$7.90	\$6.39	\$6.99	\$/Year
12. Repairs, Tools, Supplies	\$14.94	\$13.49	\$11.01	\$/Year
13. Auto Expense	\$1.89	\$2.72	\$2.21	\$/Year
14. Misc.	\$5.83	\$3.26	\$8.04	\$/Year
15. Implants	\$1.00	\$1.00	\$1.00	\$/Year
16. Investment/Bldgs & Equip.	\$316.00	\$323.00	\$350.00	\$/Acre
17. Operating Interest Rate	14.50%	14.15%	16.23%	Percent
18. Fixed Funds Interest Rate	12.25%	12.50%	13.71%	Percent
19. Native Range Value	\$385.00	\$411.00	\$440.00	\$/Acre
20. Fescue Pasture Value	\$591.00	\$622.00	\$682.00	\$/Acre

	1981	1980	1979	
1. Native Range	\$12.40	\$12.90	\$12.80	\$/Acre
2. Alfalfa Hay	\$58.56	\$50.88	\$43.06	\$/Ton
3. Soybean Meal	\$300.00	\$240.00	\$230.00	\$/Ton
4. Mineral & Salt	\$5.52	\$5.11	\$4.43	\$/Cwt.
5. Grain	\$2.30	\$2.91	\$2.20	\$/Bu.
6. Grass Hay	\$55.31	\$44.63	\$39.75	\$/Ton
7. Fescue Fertilizer	\$23.61	\$19.03	\$17.62	\$/Acre
8. Labor Wage	\$3.74	\$3.70	\$3.50	\$/Hour
9. Utilities, Fuel, Oil	\$13.87	\$12.58	\$9.49	\$/Year
10. Vet. & Drugs	\$4.39	\$4.56	\$5.28	\$/Year
11. Marketing & Breeding	\$5.79	\$5.79	\$5.30	\$/Year
12. Repairs, Tools, Supplies	\$13.11	\$10.82	\$11.06	\$/Year
13. Auto Expense	\$1.96	\$2.41	\$1.53	\$/Year
14. Misc.	\$2.87	\$3.34	\$2.31	\$/Year
15. Implants	\$1.00	\$1.00	\$1.00	\$/Year
16. Investment/Bldgs & Equip.	\$364.00	\$357.00	\$307.00	\$/Acre
17. Operating Interest Rate	15.91%	14.46%	12.28%	Percent
18. Fixed Funds Interest Rate	12.67%	11.54%	9.88%	Percent
19. Native Range Value	\$490.00	\$463.00	\$412.00	\$/Acre
20. Fescue Pasture Value	\$679.00	\$664.00	\$556.00	\$/Acre

TABLE 8.--Continued. Historical prices used in the beef cowherd cost-return budgets

	1978	1977	1976	1975
1. Native Range	\$11.10	\$10.70	\$10.90	\$10.50
2. Alfalfa Hay	\$45.38	\$53.94	\$48.25	\$48.31
3. Soybean Meal	\$210.00	\$240.00	\$170.00	\$194.00
4. Mineral & Salt	\$4.20	\$3.94	\$3.75	\$3.56
5. Grain	\$1.99	\$1.74	\$1.86	\$2.27
6. Grass Hay	\$40.94	\$51.01	\$43.86	\$46.38
7. Fescue Fertilizer	\$17.62	\$17.97	\$21.85	\$19.03
8. Labor Wage	\$2.91	\$2.60	\$2.76	\$2.53
9. Utilities, Fuel, Oil	\$7.36	\$7.28	\$6.97	\$6.07
10. Vet. & Drugs	\$4.11	\$3.93	\$4.01	\$3.11
11. Marketing & Breeding	\$5.47	\$4.17	\$3.51	\$4.76
12. Repairs, Tools, Supplies	\$7.76	\$8.09	\$7.83	\$7.88
13. Auto Expense	\$1.52	\$1.83	\$1.92	\$1.44
14. Misc.	\$2.35	\$1.79	\$1.92	\$1.61
15. Implants	\$1.00	\$1.00	\$1.00	\$1.00
16. Investment/Bldgs & Equip.	\$259.00	\$229.00	\$208.00	\$206.00
17. Operating Interest Rate	11.58%	11.58%	11.70%	11.70%
18. Fixed Funds Interest Rate	9.13%	9.13%	9.25%	9.25%
19. Native Range Value	\$354.00	\$335.00	\$310.00	\$281.00
20. Fescue Pasture Value	\$500.00	\$462.00	\$429.00	\$425.00

Historical Price Sources:

- 1) Native Range - "Bluestem Pasture Rents", Kansas Crop-Livestock Reporting Service (KC-LRS), Kansas State Board of Agriculture Division of Statistics, USDA.
- 2) Alfalfa Hay - Average Kansas price for the first eight marketing months of the previous year's hay marketing year, May-December. (KC-LRS)<sup>1</sup>
- 3) Soybean Meal - Average January Soybean Meal Price in Kansas. (KC-LRS)
- 4) Mineral and Salt - The 1984 price of a 1/2 salt and 1/2 trace mineral mix was obtained from the Manhattan Coop. This price was then indexed back to derive prices for the other nine years of the study.<sup>2</sup>

<sup>1</sup>The previous years prices were used because it was assumed, for example, that the 1983 hay crop would be fed during the winter of 1984.

<sup>2</sup>There is little historical data available pertaining to trace mineral prices. For purposes of this thesis, a close relationship between stock salt and trace mineral prices was assumed.

- 5) Grain - Kansas average annual milo price. (KC-LRS)
- 6) Grass Hay - Average Kansas price of "other hay" for the first eight marketing months of the previous year's hay marketing year, May-December. (KC-LRS)
- 7) Fescue Fertilizer - The 1984 price of a 60-30-30 (N.P.K.) application of fertilizer was based on conversations with Gary L. Kilgore, Extension Specialist, Crops and Soils, Southeast Kansas. This price was then indexed back to derive the fertilizer price for each of the ten years of this analysis.<sup>3</sup>
- 8) Labor Price - Hourly wages of livestock workers, as quoted for the month of January. (KC-LRS)
- 9) Utilities, Fuel and Oil - Based on the average costs incurred by farms with beef cowherds, enrolled in Kansas Farm Management Associations for each year of the analysis.
- 10) Vet. and Drugs - Same as 9.
- 11) Marketing and Breeding - Same as 9.
- 12) Repairs, Tools and Supplies - Same as 9.

Mineral mix prices were derived by multiplying the 1984 mineral mix price by an index of the price changes in yearly stock salt prices as reported by the Kansas Crop-Livestock Reporting Service. For example:

- (1) Manhattan Coop 1984 salt price = \$5.00 and 1984 mineral mix price = \$6.65 (per cwt. for each)
- (2)  $\$5.00 \div \$6.65 = \$11.65/2 = \$5.83$  (1984 mineral mix price/cwt.)
- (3) 1984 stock salt price = \$3.00/cwt and 1983 price = \$2.99/cwt
- (4)  $\$2.99/3.00 = .9967 \times \$5.83 = 1983 \text{ mineral mix price of } \$5.81/\text{cwt}$

<sup>3</sup>Fertilizer was assumed to be applied in the fall of the previous year, thus 1983 prices were added to the 1984 beef cowherd cost-return budget. Per pound prices of fertilizer were .23, .26 & .12 dollars for N P and K respectively. Thus for a 60-30-30 fall application in 1984 the total cost summed to \$25.50. Prices were indexed back based on the index of prices paid by farmers for fertilizer, U.S. Source, "Agricultural Prices," 1975-1984, Crop Reporting Board, ESCS, USDA.

- 13) Auto Expense - Same as 9.
  - 14) Misc. - Same as 9.
  - 15) Implants - Prices for implants make up a very small part of the total costs of a cowherd operation and have varied little over the past ten years. For these reasons they were held constant throughout this analysis at the price of one dollar as obtained from the Manhattan Coop.
  - 16) Investment/Bldgs. and Equip. - Based on the values found in KSU Farm Management Guide MF-266. A more detailed explanation can be found in Appendix 2.
  - 17) Operating Interest Rate - Based on the average interest rates on short term operating loans as charged by the Manhattan Production Credit Association and adjusted up by  $3/4\%$ .<sup>4</sup>
  - 18) Fixed Funds Interest Rate - Based on the average interest rates on intermediate to long term loans as charged by the Manhattan Federal Land Bank and adjusted up  $3/4\%$ .
  - 19) Native Range Value - Kansas farmland values, pasture in East Central Kansas. (KC-LRS)
  - 20) Fescue Pasture Value - Kansas farmland values, dryland crop ground in Southeast Kansas. (KC-LRS)
- 

<sup>4</sup>Interest rate charges by both PCA's and FLB's were adjusted up to account for the additional costs of borrowing from them. These costs primarily reflect the cost of shares that borrowers must purchase. Based on conversations with Don Pretzer, Extension Agricultural Economist, Kansas State University, an adjustment factor of  $3/4\%$  was selected.

## APPENDIX 4

## BEEF COWHERD RATINGS

Beef cow feed costs are the largest single expense faced by the cow-calf operator. Because of that, any management decisions affecting cow unit feed costs warrant careful consideration by the producer. The most significant impacts of calving season on feed costs occur as the result of two factors, the differing amounts and qualities of feed that a beef cow needs based upon her specific stage of production and the differing qualities of range available depending on the time of year.

Generally, the beef cow year is split into four distinct periods, each with a unique set of nutritional requirements necessary to meet the particular needs of the cow. Period 1 is the 90 days following calving when the cow is lactating at her highest level while trying to maintain maximum calf growth. In addition, during this period the cow must undergo uterine involution, start recycling and rebreed. Period 2 occurs during the following 120 days when the beef cow is in the early stages of pregnancy while still lactating and maintaining a calf. The third period lasts for 90 days and is called midgestation, during this stage the cow must primarily maintain its developing fetus. Period 4 is the second most important period in the beef cow year. During this 60 day period, 70% to 80% of the total fetal growth occurs and the cow must also prepare for lactation. (see table 9)

Typically the cheapest and most common feed source for the Kansas beef cow is native range. While being a vital source of nutrition for the beef cowherd, native range is also a very



seasonal source. Crude protein levels can vary from a high of 16% in May to a low of 3% in January. (see table 10)

It is because of the above mentioned seasonalities in both cow nutritional needs and grass quality that calving season management decisions can play such an important part in the overall profitability of a beef cowherd operation. The goal of this thesis is not to evaluate the feed requirements of different calving seasons, but to evaluate how these differences affect overall cow herd profitability. For that reason, beef cow rations will be calculated and then held constant throughout the analysis with only feed prices changing from year to year. This will allow the differences between calving seasons to be measured on a dollar basis and not a quantity basis.

Beef cow rations were calculated with the assistance of Dr.'s Larry Corah, and Frank Brazle, Extension Livestock Specialists, Kansas State University. The rations were calculated based on the assumption that both the spring and fall calving options would be on native range year round. Keeping cattle on native range year round, while typical for many spring calving herds in Eastern Kansas, is seldom practiced with fall calving herds. This assumption allowed the analysis of spring vs. fall calving to be evaluated using the same resource base. Permitting a more accurate analysis of the differences in profitability due to time of calving and not due to differing feed sources.

The ration building process consisted of subtracting the amount of nutrients provided by the range from the amount of nutrients required by the cow based upon her specific stage of production. Tables were organized on a Lotus 123 electronic

TABLE 9.--Nutrient requirements of an 1100 lb. Beef Cow (15 lbs. milk)

		-----Production Period-----			
		1	2	3	4
Total Dig. Nutrient (TDN)	lbs/day	13	11	9	10
Crude Protein	lbs/day	2.3	1.9	1.4	1.6
Calcium	grams/day	33	27	17	25
Phosphorus	grams/day	25	22	17	20
Vitamin A	I.U./day	39000	32000	25000	26000

TABLE 10.--Nutritional values of grazed forages

Bluestem Range			Fescue		
ESOPHAGEAL PROTEIN	TDN	AVERAGE RANGE INTAKE % BODY WT.	SHORT CLIP PROTEIN	TDN	
JAN	3%	42%	1.50%	9.00%	53%
FEB	3%	42%	1.50%	9.30%	47%
MAR	5%	40%	1.50%	12.40%	46%
APR	6%	41%	1.60%	24.40%	63%
MAY	16%	52%	2.60%	12.20%	56%
JUN	11%	51%	2.70%	9.50%	52%
JUL	9%	50%	2.20%	6.70%	50%
AUG	7%	49%	2.20%	6.20%	48%
SEP	6%	47%	1.90%	16.90%	53%
OCT	6%	46%	1.80%	14.30%	56%
NOV	5%	45%	1.70%	13.60%	53%
DEC	5%	44%	1.60%	12.30%	52%

Table 9 Source: Larry Corah, Extension State Leader, AS&I, Kansas State University, Manhattan.

Table 10 Source: "Feed Supplements for Maximum Use of Native Range", Larry Corah and Ed Smith, Cooperative Extension Service, Manhattan, Kansas. 1978 L-517

: "Tall Fescue Production and Utilization", Gary Kilgore, Frank Brazle and Marvin Fausett, Cooperative Extension Service, Manhattan, Kansas. 1980 C-622

spreadsheet that contained the monthly nutritional levels of native range (fescue pasture where applicable) on a dry matter basis. Values representing the monthly nutritional requirements of beef cows with differing calving dates were inputted and subtracted from the range values. The spreadsheet table then calculated the pounds of alfalfa necessary to supplement the range and balance the beef cow ration.<sup>1</sup> (see tables 11-13)

Upon completion of the ration balancing tables, they were each evaluated by extension animal scientists and any changes necessary were made in Table 14, the Monthly Beef Cowherd Ration Summary.<sup>2</sup> The feed amounts specified in the summary table were then used in the beef cowherd cost-return budget.

A common problem to all cow-calf operations in Kansas is the feeding difficulties associated with snowfall. In this thesis, the problem of snowfall limiting the intake of range was handled by adding an allotted amount of grass hay to the total ration. Grass hay needed to replace range (fescue where applicable) due to snow cover was based on the average number of days with one inch of snow or more on the ground. A thirty year average of the number of snow days in Kansas was provided by Dean Bark,  
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<sup>1</sup>Alfalfa was used as the first ration supplement because it is a relatively cheaper source of supplementation, and more closely fit the deficiencies of the cow. If alfalfa could not meet all of the beef cow needs, then soybean meal was added to the beef cow ration. Crude protein and TDN levels for alfalfa and SBM were derived from the 6th revised edition of the NRC publication, "Beef Cattle Nutritional Requirements", 1984. These levels are 14% & 52% CP and TDN for alfalfa and 49.9% and 84% for SBM.

<sup>2</sup>The only changes made occur in the fall calving on fescue option, where, based on field experience, less supplemental alfalfa was used. Rations for spring and fall calving on native range were simply summarized from their respective ration balancing tables.

TABLE 11.--Balanced rations for spring calving on native range

SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
JANUARY-Range Intake lbs			JANUARY-Range Intake lbs		
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.50	6.93	RANGE	0.50	6.93
STAGE 4 NEEDS	1.60	10.00	STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	1.11	3.07	DEFICIENCY	0.91	2.07
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	7.89	5.90	= THE LARGER OF	6.46	3.98
ALFALFA NUT.	1.11	4.10	ALFALFA NUT.	0.90	3.36
NUT. W/ ALFALFA	1.60	11.03	NUT. W/ ALFALFA	1.40	10.29
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	24.39	22.40	= THE LARGER OF	22.96	20.48
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	8.53	13.59	= THE LARGER OF	8.53	13.59
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
FEBRUARY-Range Intake lb			FEBRUARY-Range Intake lb		
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.50	6.77	RANGE	0.50	6.77
STAGE 4/1 NEEDS	1.95	11.50	STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	1.46	4.74	DEFICIENCY	0.91	2.24
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	10.39	9.11	= THE LARGER OF	6.46	4.30
ALFALFA NUT.	1.46	5.40	ALFALFA NUT.	0.90	3.36
NUT. W/ ALFALFA	1.95	12.17	NUT. W/ ALFALFA	1.40	10.13
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	26.89	25.61	= THE LARGER OF	22.96	20.80
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	8.53	13.26	= THE LARGER OF	8.53	13.26
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
MARCH-Range Intake lbs			MARCH-Range Intake lbs		
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.83	6.60	RANGE	0.83	6.60
STAGE 1 NEEDS	2.30	13.00	STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	1.48	6.40	DEFICIENCY	0.78	3.40
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	10.54	12.31	= THE LARGER OF	5.54	6.54
ALFALFA NUT.	1.72	6.40	ALFALFA NUT.	0.92	3.40
NUT. W/ ALFALFA	2.55	13.00	NUT. W/ ALFALFA	1.74	10.00
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	27.04	28.81	= THE LARGER OF	22.04	23.04
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	14.22	12.94	= THE LARGER OF	14.22	12.94

-Ration supplements are alfalfa and SBM (if needed)

-All values in pounds (dry matter basis)

TABLE 11.--Continued.Balanced rations for spring calving on native range

SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
APRIL-Range Intake lbs	17.60		APRIL-Range Intake lbs	17.60	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.06	7.22	RANGE	1.06	7.22
STAGE 1 NEEDS	2.30	13.00	STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	1.24	5.78	DEFICIENCY	0.54	2.78
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	8.89	11.12	= THE LARGER OF	3.89	5.35
ALFALFA NUT.	1.56	5.78	ALFALFA NUT.	0.75	2.78
NUT. W/ ALFALFA	2.61	13.00	NUT. W/ ALFALFA	1.81	10.00
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	26.49	28.72	= THE LARGER OF	21.49	22.95
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
MAY-Range Intake lbs	28.60		MAY-Range Intake lbs	28.60	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	4.58	14.87	RANGE	4.58	14.87
STAGE 1 NEEDS	2.30	13.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-2.28	-1.87	DEFICIENCY	-2.28	-1.87
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	4.58	14.87	NUT. W/ ALFALFA	4.58	14.87
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	28.60	28.60	= THE LARGER OF	28.60	28.60
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
JUNE-Range Intake lbs	29.70		JUNE-Range Intake lbs	29.70	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	3.27	15.15	RANGE	3.27	15.15
STAGE 2 NEEDS	1.90	11.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-1.37	-4.15	DEFICIENCY	-0.97	-2.15
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	3.27	15.15	NUT. W/ ALFALFA	3.27	15.15
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	29.70	29.70	= THE LARGER OF	29.70	29.70

TABLE 11.--Continued.Balanced rations for spring calving on native range

SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
JULY-Range Intake lbs		24.20	JULY-Range Intake lbs		24.20
	PROTEIN	TDN		PROTEIN	TDN
RANGE	2.18	12.10	RANGE	2.18	12.10
STAGE 2 NEEDS	1.90	11.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-0.28	-1.10	DEFICIENCY	0.12	0.90
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.18	12.10	NUT. W/ ALFALFA	2.18	12.10
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20	= THE LARGER OF	24.20	24.20
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
AUGUST-Range Intake lbs		24.20	AUGUST-Range Intake lbs		24.20
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.69	11.86	RANGE	1.69	11.86
STAGE 2 NEEDS	1.90	11.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	0.21	-0.86	DEFICIENCY	0.21	-0.86
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.69	11.86	NUT. W/ ALFALFA	1.69	11.86
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20	= THE LARGER OF	24.20	24.20
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
SEP-Range Intake lbs		21.00	SEP-Range Intake lbs		21.00
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.26	9.87	RANGE	1.26	9.87
STAGE 2 NEEDS	1.90	11.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	0.64	1.13	DEFICIENCY	0.64	1.13
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.26	9.87	NUT. W/ ALFALFA	1.26	9.87
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	21.00	21.00	= THE LARGER OF	21.00	21.00

TABLE 11.--Continued.Balanced rations for spring calving on native range

SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
OCTOBER--Range Intake lbs	19.80		OCTOBER--Range Intake lbs	19.80	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.19	9.11	RANGE	1.19	9.11
STAGE 3 NEEDS	1.40	9.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	0.21	-0.11	DEFICIENCY	0.71	1.89
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.19	9.11	NUT. W/ ALFALFA	1.19	9.11
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	19.80	19.80	= THE LARGER OF	19.80	19.80
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
NOVEMBER--Range Intake lb	18.70		NOVEMBER--Range Intake lb	18.70	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.94	8.42	RANGE	0.94	8.42
STAGE 3 NEEDS	1.40	9.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	0.47	0.59	DEFICIENCY	0.97	2.59
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	0.94	8.42	NUT. W/ ALFALFA	0.94	8.42
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	18.70	18.70	= THE LARGER OF	18.70	18.70
SPRING CALVING (FEB-MAR)			SPRING CALVING (APR-MAY)		
DECEMBER--Range Intake lb	17.60		DECEMBER--Range Intake lb	17.60	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.88	7.74	RANGE	0.88	7.74
STAGE 3 NEEDS	1.40	9.00	STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	0.52	1.26	DEFICIENCY	0.52	1.26
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	3.71	2.42	= THE LARGER OF	3.71	2.42
ALFALFA NUT.	0.52	1.93	ALFALFA NUT.	0.52	1.93
NUT. W/ ALFALFA	1.40	9.68	NUT. W/ ALFALFA	1.40	9.68
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	21.31	20.02	= THE LARGER OF	21.31	20.02
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	15.17	15.18	= THE LARGER OF	15.17	15.18

TABLE 12.--Balanced rations for fall calving on native range

FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
JANUARY--Range Intake lbs		18.70	JANUARY--Range Intake lbs		18.70
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.56	7.85	RANGE	0.56	7.85
STAGE 2 NEEDS	1.90	11.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	1.34	3.15	1 lb. SBM	0.50	0.84
LBS ALFALFA REQ			DEFICIENCY	1.24	4.31
= THE LARGER OF	9.56	6.05	LBS ALFALFA REQ		
ALFALFA NUT.	1.34	4.97	= THE LARGER OF	8.86	8.28
NUT. W/ ALFALFA	1.90	12.83	ALFALFA NUT.	1.24	4.61
TOT DRY MAT LBS			NUT. W/ ALFALFA	2.30	13.30
= THE LARGER OF	28.26	24.75	TOT DRY MAT LBS		
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	9.67	15.40	= THE LARGER OF	9.67	15.40
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
FEBRUARY--Range Intake lb		18.70	FEBRUARY--Range Intake lb		18.70
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.56	7.67	RANGE	0.56	7.67
STAGE 2 NEEDS	1.90	11.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	1.34	3.33	1 lb. SBM	0.50	0.84
LBS ALFALFA REQ			DEFICIENCY	1.24	4.49
= THE LARGER OF	9.56	6.41	LBS ALFALFA REQ		
ALFALFA NUT.	1.34	4.97	= THE LARGER OF	8.86	8.64
NUT. W/ ALFALFA	1.90	12.64	ALFALFA NUT.	1.24	4.61
TOT DRY MAT LBS			NUT. W/ ALFALFA	2.30	13.11
= THE LARGER OF	28.26	25.11	TOT DRY MAT LBS		
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	9.67	15.03	= THE LARGER OF	9.67	15.03
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
MARCH--Range Intake lbs		18.70	MARCH--Range Intake lbs		18.70
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.94	7.48	RANGE	0.94	7.48
STAGE 2 NEEDS	1.90	11.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	0.97	3.52	DEFICIENCY	0.97	3.52
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	6.89	6.77	= THE LARGER OF	6.89	6.77
ALFALFA NUT.	0.97	3.58	ALFALFA NUT.	0.97	3.58
NUT. W/ ALFALFA	1.90	11.06	NUT. W/ ALFALFA	1.90	11.06
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	25.59	25.47	= THE LARGER OF	25.59	25.47
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	16.12	14.67	= THE LARGER OF	16.12	14.67

-Ration supplements are alfalfa and SBM (if needed)

-Fall caving range intake increased .2% each month except for the months of May, June, July & August. (Source: Larry Corah)

-All values in pounds (dry matter basis)



TABLE 12.--Continued.Balanced rations for fall calving on native range

FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
APRIL-Range Intake lbs		19.80	APRIL-Range Intake lbs		19.80
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.19	8.12	RANGE	1.19	8.12
STAGE 2 NEEDS	1.90	11.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	0.71	2.88	DEFICIENCY	0.71	2.88
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	5.09	5.54	= THE LARGER OF	5.09	5.54
ALFALFA NUT.	0.78	2.88	ALFALFA NUT.	0.78	2.88
NUT. W/ ALFALFA	1.96	11.00	NUT. W/ ALFALFA	1.96	11.00
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	24.89	25.34	= THE LARGER OF	24.89	25.34
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
MAY-Range Intake lbs		28.60	MAY-Range Intake lbs		28.60
	PROTEIN	TDN		PROTEIN	TDN
RANGE	4.58	14.87	RANGE	4.58	14.87
STAGE 3 NEEDS	1.40	9.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-3.18	-5.87	DEFICIENCY	-2.68	-3.87
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	4.58	14.87	NUT. W/ ALFALFA	4.58	14.87
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	28.60	28.60	= THE LARGER OF	28.60	28.60
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
JUNE-Range Intake lbs		29.70	JUNE-Range Intake lbs		29.70
	PROTEIN	TDN		PROTEIN	TDN
RANGE	3.27	15.15	RANGE	3.27	15.15
STAGE 3 NEEDS	1.40	9.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-1.87	-6.15	DEFICIENCY	-1.37	-4.15
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	3.27	15.15	NUT. W/ ALFALFA	3.27	15.15
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	29.70	29.70	= THE LARGER OF	29.70	29.70

TABLE 12.--Continued.Balanced rations for fall calving on native range

FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
JULY-Range Intake lbs		24.20	JULY-Range Intake lbs		24.20
	PROTEIN	TDN		PROTEIN	TDN
RANGE	2.18	12.10	RANGE	2.18	12.10
STAGE 3 NEEDS	1.40	9.00	STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-0.78	-3.10	DEFICIENCY	-0.78	-3.10
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.18	12.10	NUT. W/ ALFALFA	2.18	12.10
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20	= THE LARGER OF	24.20	24.20
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
AUGUST-Range Intake lbs		24.20	AUGUST-Range Intake lbs		24.20
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.69	11.86	RANGE	1.69	11.86
STAGE 4 NEEDS	1.60	10.00	STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-0.09	-1.86	DEFICIENCY	-0.29	-2.86
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.69	11.86	NUT. W/ ALFALFA	1.69	11.86
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20	= THE LARGER OF	24.20	24.20
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
SEP-Range Intake lbs		23.10	SEP-Range Intake lbs		23.10
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.39	10.86	RANGE	1.39	10.86
STAGE 4 NEEDS	1.60	10.00	STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	0.21	-0.86	DEFICIENCY	0.01	-1.86
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.39	10.86	NUT. W/ ALFALFA	1.39	10.86
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	23.10	23.10	= THE LARGER OF	23.10	23.10

TABLE 12.—Continued. Balanced rations for fall calving on native range

FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
OCTOBER—Range Intake lbs	22.00		OCTOBER—Range Intake lbs	22.00	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.32	10.12	RANGE	1.32	10.12
STAGE 1 NEEDS	2.30	13.00	STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	0.98	2.88	DEFICIENCY	0.28	-0.12
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	7.00	5.54	= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.98	3.64	ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.30	13.76	NUT. W/ ALFALFA	1.32	10.12
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	29.00	27.54	= THE LARGER OF	22.00	22.00
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
NOVEMBER—Range Intake lb	20.90		NOVEMBER—Range Intake lb	20.90	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	1.05	9.41	RANGE	1.05	9.41
STAGE 1 NEEDS	2.30	13.00	STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	1.26	3.60	DEFICIENCY	0.56	0.60
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	8.96	6.91	= THE LARGER OF	3.96	1.14
ALFALFA NUT.	1.26	4.66	ALFALFA NUT.	0.56	2.06
NUT. W/ ALFALFA	2.30	14.07	NUT. W/ ALFALFA	1.60	11.47
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	29.86	27.81	= THE LARGER OF	24.86	22.04
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
DECEMBER—Range Intake lb	19.80		DECEMBER—Range Intake lb	19.80	
	PROTEIN	TDN		PROTEIN	TDN
RANGE	0.99	8.71	RANGE	0.99	8.71
STAGE 1 NEEDS	2.30	13.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	1.31	4.29	DEFICIENCY	1.31	4.29
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	9.36	8.25	= THE LARGER OF	9.36	8.25
ALFALFA NUT.	1.31	4.87	ALFALFA NUT.	1.31	4.87
NUT. W/ ALFALFA	2.30	13.58	NUT. W/ ALFALFA	2.30	13.58
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	29.16	28.05	= THE LARGER OF	29.16	28.05
HAY REQ TO			HAY REQ TO		
REPLACE RANGE			REPLACE RANGE		
= THE LARGER OF	17.07	17.08	= THE LARGER OF	17.07	17.08

TABLE 13.--Balanced rations for fall calving on fescue &amp; range

FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
JANDARY-Range Intake lbs	17.60		JANUARY-Range Intake lbs	17.60	
	PROTEIN	TDN		PROTEIN	TDN
FESCUE	1.58	9.33	FESCUE	1.58	9.33
STAGE 2 NEEDS	1.90	11.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	0.32	1.67	DEFICIENCY	0.72	3.67
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	2.26	3.22	= THE LARGER OF	5.11	7.06
ALFALFA NUT.	0.45	1.67	ALFALFA NUT.	0.99	3.67
NUT. W/ ALFALFA	2.03	11.00	NUT. W/ ALFALFA	2.57	13.00
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	19.86	20.82	= THE LARGER OF	22.71	24.66
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
FEBRUARY-Range Intake lb	17.60		FEBRDARY-Range Intake lb	17.60	
	PROTEIN	TDN		PROTEIN	TDN
FESCUE	1.64	8.28	FESCUE	1.64	8.28
STAGE 2 NEEDS	1.90	11.00	STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	0.26	2.72	DEFICIENCY	0.66	4.72
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	1.88	5.24	= THE LARGER OF	4.74	9.08
ALFALFA NUT.	0.73	2.72	ALFALFA NUT.	1.27	4.72
NUT. W/ ALFALFA	2.37	11.00	NUT. W/ ALFALFA	2.91	13.00
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	19.48	22.84	= THE LARGER OF	22.34	26.68
FALL CALVING (SEP-OCT)			FALL CALVING (NOV-DEC)		
MARCH-Range Intake lbs	18.70		MARCH-Range Intake lbs	18.70	
	PROTEIN	TDN		PROTEIN	TDN
FESCUE	2.32	8.69	FESCUE	2.32	8.69
STAGE 2 NEEDS	1.90	11.00	STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-0.42	2.31	DEFICIENCY	-0.42	2.31
LBS ALFALFA REQ			LBS ALFALFA REQ		
= THE LARGER OF	0.00	4.44	= THE LARGER OF	0.00	4.44
ALFALFA NUT.	0.62	2.31	ALFALFA NUT.	0.62	2.31
NUT. W/ ALFALFA	2.94	11.00	NUT. W/ ALFALFA	2.94	11.00
TOT DRY MAT LBS			TOT DRY MAT LBS		
= THE LARGER OF	18.70	23.14	= THE LARGER OF	18.70	23.14

-Ration supplements are alfalfa and SBM (if needed)

-Fall calving range intake increased .1% for Jan & Feb, and .2% for all other months except May, June, July & August. (Source: Corah)

-All values in pounds (dry matter basis)

TABLE 13.--Continued.Balanced rations for fall calving on fescue &amp; range

## FALL CALVING (SEP-OCT)

APRIL-Range Intake lbs	19.80	
	PROTEIN	TDN
FESCUE	4.83	12.55
STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-2.93	-1.55
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	4.83	12.55
TOT DRY MAT LBS		
= THE LARGER OF	19.80	19.80

## FALL CALVING (NOV-DEC)

APRIL-Range Intake lbs	19.80	
	PROTEIN	TDN
FESCUE	4.83	12.55
STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-2.93	-1.55
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	4.83	12.55
TOT DRY MAT LBS		
= THE LARGER OF	19.80	19.80

## FALL CALVING (SEP-OCT)

MAY-Range Intake lbs	28.60	
	PROTEIN	TDN
RANGE	4.58	14.87
STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-3.18	-5.87
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	4.58	14.87
TOT DRY MAT LBS		
= THE LARGER OF	28.60	28.60

## FALL CALVING (NOV-DEC)

MAY-Range Intake lbs	28.60	
	PROTEIN	TDN
RANGE	4.58	14.87
STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-2.68	-3.87
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	4.58	14.87
TOT DRY MAT LBS		
= THE LARGER OF	28.60	28.60

## FALL CALVING (SEP-OCT)

JUNE-Range Intake lbs	29.70	
	PROTEIN	TDN
RANGE	3.27	15.15
STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-1.87	-6.15
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	3.27	15.15
TOT DRY MAT LBS		
= THE LARGER OF	29.70	29.70

## FALL CALVING (NOV-DEC)

JUNE-Range Intake lbs	29.70	
	PROTEIN	TDN
RANGE	3.27	15.15
STAGE 2 NEEDS	1.90	11.00
DEFICIENCY	-1.37	-4.15
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	3.27	15.15
TOT DRY MAT LBS		
= THE LARGER OF	29.70	29.70

TABLE 13.--Continued.Balanced rations for fall calving on fescue &amp; range

## FALL CALVING (SEP-OCT)

JULY-Range Intake lbs	24.20	
	PROTEIN	TDN
RANGE	2.18	12.10
STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-0.78	-3.10
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.18	12.10
TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20

## FALL CALVING (NOV-DEC)

JULY-Range Intake lbs	24.20	
	PROTEIN	TDN
RANGE	2.18	12.10
STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-0.78	-3.10
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.18	12.10
TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20

## FALL CALVING (SEP-OCT)

AUGUST-Range Intake lbs	24.20	
	PROTEIN	TDN
RANGE	1.69	11.86
STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	-0.09	-1.86
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.69	11.86
TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20

## FALL CALVING (NOV-DEC)

AUGUST-Range Intake lbs	24.20	
	PROTEIN	TDN
RANGE	1.69	11.86
STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	-0.29	-2.86
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.69	11.86
TOT DRY MAT LBS		
= THE LARGER OF	24.20	24.20

## FALL CALVING (SEP-OCT)

SEP-Range Intake lbs	23.10	
	PROTEIN	TDN
RANGE	1.39	10.86
STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	0.21	-0.86
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.39	10.86
TOT DRY MAT LBS		
= THE LARGER OF	23.10	23.10

## FALL CALVING (NOV-DEC)

SEP-Range Intake lbs	23.10	
	PROTEIN	TDN
RANGE	1.39	10.86
STAGE 3 NEEDS	1.40	9.00
DEFICIENCY	0.01	-1.86
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	1.39	10.86
TOT DRY MAT LBS		
= THE LARGER OF	23.10	23.10

TABLE 13.--Continued.Balanced rations for fall calving on fescue &amp; range

## FALL CALVING (SEP-OCT)

OCTOBER-Range Intake lbs	22.00	
	PROTEIN	TDN
FESCUE	3.15	12.25
STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-0.85	0.75
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	3.15	12.25
TOT DRY MAT LBS		
= THE LARGER OF	22.00	22.00

## FALL CALVING (NOV-DEC)

OCTOBER-Range Intake lbs	22.00	
	PROTEIN	TDN
FESCUE	3.15	12.25
STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	-1.55	-2.25
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	3.15	12.25
TOT DRY MAT LBS		
= THE LARGER OF	22.00	22.00

## FALL CALVING (SEP-OCT)

NOVEMBER-Range Intake lb	20.90	
	PROTEIN	TDN
FESCUE	2.84	11.05
STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-0.54	1.95
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.84	11.05
TOT DRY MAT LBS		
= THE LARGER OF	20.90	20.90

## FALL CALVING (NOV-DEC)

NOVEMBER-Range Intake lb	20.90	
	PROTEIN	TDN
FESCUE	2.84	11.05
STAGE 4 NEEDS	1.60	10.00
DEFICIENCY	-1.24	-1.05
LBS ALFALFA REQ		
= THE LARGER OF	0.00	0.00
ALFALFA NUT.	0.00	0.00
NUT. W/ ALFALFA	2.84	11.05
TOT DRY MAT LBS		
= THE LARGER OF	20.90	20.90

## FALL CALVING (SEP-OCT)

DECEMBER-Range Intake lb	19.80	
	PROTEIN	TDN
FESCUE	2.44	10.21
STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-0.14	2.79
LBS ALFALFA REQ		
= THE LARGER OF	0.00	5.36
ALFALFA NUT.	0.75	2.79
NUT. W/ ALFALFA	3.19	13.00
TOT DRY MAT LBS		
= THE LARGER OF	19.80	25.16

## FALL CALVING (NOV-DEC)

DECEMBER-Range Intake lb	19.80	
	PROTEIN	TDN
FESCUE	2.44	10.21
STAGE 1 NEEDS	2.30	13.00
DEFICIENCY	-0.14	2.79
LBS ALFALFA REQ		
= THE LARGER OF	0.00	5.36
ALFALFA NUT.	0.75	2.79
NUT. W/ ALFALFA	3.19	13.00
TOT DRY MAT LBS		
= THE LARGER OF	19.80	25.16

TABLE 14.--Monthly cowherd ration summary

----- Year Round Native Range -----						
Months Calving	SPRING CALVING		FALL CALVING		FALL FESCUE *	
	(FB-MR)	(AP-MY)	(SP-OC)	(NV-DC)	(SP-OC)	(NV-DC)
Native Range AC	8.0	8.0	9.5	9.5	6.5	6.5
Fescue AC	0.0	0.0	0.0	0.0	1.5	1.5

## ALFALFA NEEDS: LBS/DAY/MONTH (dry matter basis)

JAN	7.9	6.5	9.6	8.9 **	3.2	4.5
FEB	10.4	6.5	9.6	8.9 **	4.0	5.0
MAR	12.3	6.5	6.9	6.9	3.5	3.5
APR	11.1	5.4	5.5	5.5	0.0	0.0
MAY	0.0	0.0	0.0	0.0	0.0	0.0
JUN	0.0	0.0	0.0	0.0	0.0	0.0
JUL	0.0	0.0	0.0	0.0	0.0	0.0
AUG	0.0	0.0	0.0	0.0	0.0	0.0
SEP	0.0	0.0	0.0	0.0	0.0	0.0
OCT	0.0	0.0	7.0	0.0	0.0	0.0
NOV	0.0	0.0	9.0	4.0	0.0	0.0
DEC	3.7	3.7	9.4	9.4	0.0	0.0

## ALFALFA NEEDS: LBS/MONTH (dry matter basis)

JAN	244.7	200.4	296.5	274.6	99.7	139.5
FEB	291.0	181.0	267.8	248.0	112.0	140.0
MAR	381.5	202.7	213.7	213.7	108.5	108.5
APR	333.7	160.6	166.3	166.3	0.0	0.0
MAY	0.0	0.0	0.0	0.0	0.0	0.0
JUN	0.0	0.0	0.0	0.0	0.0	0.0
JUL	0.0	0.0	0.0	0.0	0.0	0.0
AUG	0.0	0.0	0.0	0.0	0.0	0.0
SEP	0.0	0.0	0.0	0.0	0.0	0.0
OCT	0.0	0.0	217.0	0.0	0.0	0.0
NOV	0.0	0.0	268.9	118.9	0.0	0.0
DEC	115.1	115.1	290.1	290.1	0.0	0.0
TOTAL LBS.	1366.1	859.8	1720.2	1311.5	320.2	388.0
AS FED	1517.8	955.4	1911.4	1457.2	352.2	426.8
10% WASTAGE	1686.5	1061.5	2123.8	1619.2	387.4	469.5

\* In the fall fescue pasture option, cows are on fescue from October 1 to April 30, and then on native range from May 1 to September 30.

Fall fescue was fertilized each year at the rate of 60-30-30 (lbs NPK).

\*\* In the native range late fall calving option (Nov-Dec), 1 lb of soybean meal was fed per day in the months of January and February, this sums to 31 and 28 lbs per month respectively.



Climatologist, Kansas Agricultural Experiment Station. (Figure 6)

The average annual snow days for both Manhattan and Southeast Kansas were then arbitrarily spread over the months of December through March. The pounds of grass hay necessary to replace range was determined by taking the pounds of total digestible nutrients (TDN) and crude protein provided by the range for each month and then calculating the pounds of grass hay needed to equal each of those nutrient levels. The larger of the two amounts was then entered into the total cow ration.<sup>3</sup> Table 15 shows the pounds of grass hay/month needed for spring and fall calving on native range and for both early and late fall calving on fescue.

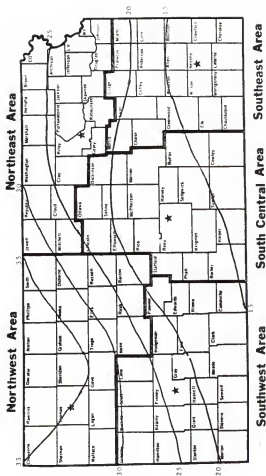
TABLE 15.--Pounds of grass hay needed in the winter

	----- Native Range ----- (Manhattan)			----- FESCUE ----- (Southeast Kansas)		
	snow days 1" or more	SPRING	FALL	snow days 1" or more	SEP-OCT	NOV-DEC
December	5	76.0	85.5	2	50.0	50.0
January	6	81.6	91.8	4	73.2	83.6
February	6	79.8	90.0	4	70.0	81.6
March	5	71.5	81.0	2	36.0	36.0
Totals	22	308.9	348.3	12	229.2	251.2
As fed		339.8	383.1		252.1	276.3
10% waste		373.8	421.4		277.3	304.0

Bull and replacement heifer feed costs make up the second component of total cow unit feed costs. These costs are not

<sup>3</sup>An example is now provided. Range intake for a spring calving cow in the month of January is 16.5 lbs, and provides .5 and 6.93 lbs of crude protein and TDN respectively. (table 11) Dividing .5 by 5.8% and 6.93 by 51% results in 8.6 and 13.6 lbs of grass hay necessary to replace the crude protein and TDN in native range. The 13.6 lbs, the larger of the two is then multiplied by 6 days and 81.6 pounds of grass hay is then added to the total ration for the month of January.

Figure 6. Number of days with 1" or more of snow on the ground (1960-1970)



directly affected by calving season and can vary from producer to producer depending upon how he manages his bulls and replacement heifers. Yet these costs are an important part of total beef cow unit feed costs and because of this, were calculated and held constant among all calving season management options with only feed prices changing from year to year. This allowed the study to better evaluate feed costs between cows of differing calving seasons and not reflect differences in bull and heifer management.

Replacement heifers were assumed weaned at 7 months of age weighing 422 pounds and bred to calve at 24 months of age weighing 950. The average weight then was 686 pounds, and it was this weight of heifer that the rations were calculated for. The difference between the 24 and 7 months results in a period of 17 months of replacement heifer ownership that must correspond to a 12 month cow unit budget. In order to adapt replacement heifer ownership time to the 12 month cow year, a conversion factor of 1.42 ( $17/12$ ) was used. The management program used for heifers called for them to be on range from May through September and drylot from October through April. Thus the five months spent on grass was converted to 7.1 months ( $5 \times 1.42$ ), or 213 days, and the 7 months of drylot resulted in 9.9 months (297 days).

The nutritional requirements of a 686 lb replacement heifer were obtained from 1984 NRC beef cattle nutritional requirements and were 9.35 lbs of TDN and 1.35 lbs of crude protein per day, based on a daily dry matter (DM) intake of 16.5 pounds.

Replacement heifer rations used were<sup>4</sup>:

Native range: 7.1 months x .875 head/acre = 6.2 acres

Drylot rations consisted of 6, 9 & 1.5 pounds of alfalfa, grass hay and milo per day respectively.

Alfalfa : 6 lbs x 297 days = 1782 lbs (DM basis)

Grass hay : 9 lbs x 297 days = 2673 lbs (DM basis)

Milo : 1.5 lbs x 297 days = 445.5 lbs (DM basis)

Total pounds were then adjusted to an as fed basis plus five percent feed waste and converted to tons and bushels.

Total replacement heifer feed costs were<sup>5</sup>:

Native range: 6.2 acres x yearly pasture rent = range cost

Alfalfa : 1.03 tons x alfalfa price/ton = alfalfa cost

Grass hay : 1.54 tons x grass hay price/ton = hay cost

Milo : 9.45 bu x milo price/bushel = milo cost

Total Cost

Total cost x .15 heifer replacement/cow unit = cow unit share of total replacement heifer feed costs

Bulls were assumed to weigh an average of 1600 pounds. According to 1984 NRC requirements their nutritional needs based on 40 pounds of DM intake were 2.2 and 16.6 pounds of crude protein and TDN respectively. Bull management, rations and total feed costs were calculated the same as that for replacement heifers. 40 pounds of grass hay were found to provide all required nutrients of the bull while in drylot.

Bull rations used were:

Native range: 5 months x 1.56 head/acre = 7.8 acres

Grass hay : 40 lbs x 210 days = 8400 lbs (DM)

<sup>4</sup>Bull and heifer rations were based on conversations with Larry Corah, Extension State Leader, Animal Science and Industry, Kansas State University.

<sup>5</sup>Yearly prices were obtained from Appendix 3.

Total bull feed costs were:

Native range	:	7.8 x yearly pasture rent	=	range cost
Grass bay	:	4.85 tons x hay price/T	=	<u>hay cost</u>
				Total cost

Total cost x .04 bull share/cow unit = cow unit share of total  
bull feed costs

Cow unit shares of both bull and replacement heifer feed costs were then summed to derive total bull and replacement heifer feed costs as used in the beefcow cost-return budget.

Gross revenue for any cow-calf operation is dependent on two factors, the pounds of beef produced and the price received for those pounds.

To be accurate, an analysis of calving season must hold constant factors of production that are not directly affected by calving season. In order to eliminate genetic differences in cattle from affecting the results, the simulated performances of an 1100 lb Hereford x Angus cow and her exotic sired calf were used for every calving season management option in this study. These simulations were based on conversations with Kansas State University Extension Animal Scientists.<sup>1</sup>

At birth, bulls and heifers were assumed to weigh 70 and 65 pounds respectively. The formula used to calculate weaning weights was:

$$\text{weaning weight} = \text{birth weight} + (\text{days of age} \times \text{estimated average daily gains}).$$

Estimated average daily gains were based primarily on the environmental conditions and grass quality encountered by each calving season.

Estimated average daily gains were:

Spring			Fall		
	steers	heifers		steers	heifers
Feb-Mar	1.96	1.86	Sept-Oct	1.86	1.76
Apr-May	1.81	1.71	Nov-Dec	1.81	1.71 <sup>2</sup>

<sup>1</sup> Larry Corah, Extension State Leader, Animal Science and Industry and Keith Zoelner, Extension Specialist, AS & I, Kansas State University.

<sup>2</sup> After July these average daily gains decline to 1.39 and 1.32 pounds per day respectively. This is due to the lower grass quality that occurs during the late summer months.

Days of age for each calving season management option were derived after the weaning date was selected. November 1 was chosen for both spring calving options because it was assumed that all spring calves are weaned in the fall regardless of date of birth. In the case of the two fall calving options, May 1 and July 15 were selected because both calves would then be approximately seven months of age. In addition, May 1 allows the option of selling the calves to go on grass and July 15 is generally regarded as a time when grass quality begins to deteriorate at a rapid rate, with lower gains being the result. July 1 and September 1 were selected because at that time each calf would be nine months of age and proper management dictates that calves be weaned to allow the cow to prepare for parturition and lactation.

After determining the formula coefficients, the weaning weights for each calving season option were calculated.<sup>3</sup>

<u>Calving Season</u>	<u>Date Weaned</u>	<u>Days of Age</u>	<u>Weaning Weights</u>	
			<u>Steers</u>	<u>Heifers</u>
Feb-Mar	Nov. 1	245	550	521
Apr-May	Nov. 1	184	403	380
Sep-Oct	May 1	212	464	438
Sep-Oct	July 1	273	578	545
Nov-Dec	July 15	227	481	453
Nov-Dec	Sep. 1	274	546	515

These average daily gains were selected based on KSU Range Research Station data that suggest August-September ADG's are 77% of the ADG's from May-July.

<sup>3</sup>It should be noted that the weaning weights selected were not the actual weights used to calculate gross revenue. A 90% calf crop consisting of half steers and half heifers and the retention of 15% of your calf crop for herd replacement was assumed. These assumptions, mean that 45% of the steer weight, 30% of the heifer weight and 15% of the cull cow weight were used in the calculation of gross revenue.

It should be noted that the weaning weight formulas used in this thesis result in the following adjusted 205 day weaning weights.

	Spring			Fall	
	steers	heifers		steers	heifers
Feb-Mar	472	446	Sept-Oct	451	426
Apr-May	441	416	Nov-Dec	441	416

The weaning weights, once selected were held constant throughout the analysis with only calf prices changing from year to year. This was to 1) reflect the fact that with proper management yearly weaning weights should be constant if not increasing, and 2) allow a better analysis of year to year changes in calf prices.

Calf prices used were monthly average prices situated around the calf sale date. For example, the November 1 sale date price, was a four week (1 month) average sale price consisting of the last two weeks of October and the first two weeks of November. These averages represented the prices of Kansas City choice medium framed steers and heifers.

The last component of gross revenue is that resulting from cull cow sales. Cull cows were assumed to weigh 1100 lbs for each calving season alternative, and to be sold at the time of weaning. Price calculations were the same as that for feeder calves.



TABLE 16.--Cattle prices used in beef cowherd cost-return budgets

## =====

## STEER PRICES

Calving Season *	Calf Wt.	1984	1983	1982	1981	1980	K.C. Feeder Calves
FEB-MAR/8	550	\$66.31	\$62.26	\$64.05	\$64.15	\$78.63	5-6 CWT
APR-MAY/6	403	\$68.18	\$64.98	\$66.13	\$66.55	\$81.53	4-5 CWT
SEP-OCT/9	578	\$66.03	\$65.71	\$66.36	\$67.91	\$76.47	5-6 CWT
NOV-DEC/9	546	\$64.99	\$58.70	\$69.94	\$69.22	\$82.48	5-6 CWT
SEP-OCT/7	464	\$71.11	\$76.10	\$70.95	\$74.60	\$82.75	4-5 CWT
NOV-DEC/7.5	481	\$66.21	\$65.71	\$68.35	\$69.04	\$77.12	4-5 CWT
		1979	1978	1977	1976	1975	
FEB-MAR/8	550	\$86.41	\$67.73	\$41.56	\$37.89	\$37.34	5-6 CWT
APR-MAY/6	403	\$92.11	\$71.33	\$43.07	\$39.33	\$35.67	4-5 CWT
SEP-OCT/9	578	\$87.76	\$62.30	\$41.24	\$40.46	\$35.17	5-6 CWT
NOV-DEC/9	546	\$94.54	\$68.39	\$44.16	\$39.96	\$34.89	5-6 CWT
SEP-OCT/7	464	\$109.23	\$63.48	\$45.97	\$47.57	\$33.25	4-5 CWT
NOV-DEC/7.5	481	\$98.72	\$68.42	\$43.14	\$40.64	\$32.58	4-5 CWT

## HEIFER PRICES

Calving Season	Calf Wt.	1984	1983	1982	1981	1980	K.C. Feeder Calves
FEB-MAR/8	521	\$57.00	\$51.89	\$56.48	\$55.88	\$67.28	5-6 CWT
APR-MAY/6	380	\$56.52	\$52.23	\$55.03	\$55.10	\$70.66	3-4 CWT
SEP-OCT/9	545	\$55.50	\$57.21	\$56.93	\$59.44	\$67.16	5-6 CWT
NOV-DEC/9	515	\$57.17	\$50.34	\$61.98	\$60.07	\$70.09	5-6 CWT
SEP-OCT/7	438	\$59.31	\$62.75	\$59.20	\$62.88	\$67.23	4-5 CWT
NOV-DEC/7.5	453	\$55.60	\$57.03	\$58.21	\$58.08	\$68.12	4-5 CWT
		1979	1978	1977	1976	1975	
FEB-MAR/8	521	\$75.08	\$58.60	\$35.49	\$30.99	\$28.99	5-6 CWT
APR-MAY/6	380	\$80.78	\$62.84	\$34.96	\$30.60	\$24.65	3-4 CWT
SEP-OCT/9	545	\$80.18	\$53.43	\$36.13	\$34.90	\$29.25	5-6 CWT
NOV-DEC/9	515	\$79.19	\$59.43	\$37.52	\$34.56	\$28.93	5-6 CWT
SEP-OCT/7	438	\$92.38	\$52.96	\$36.87	\$38.84	\$25.60	4-5 CWT
NOV-DEC/7.5	453	\$83.52	\$58.48	\$36.62	\$34.48	\$26.64	4-5 CWT

TABLE 16.--Continued. Cattle prices used in beef cowherd  
cost-return budgets

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CULL COW PRICES

Calving Season	Sale Date	1984	1983	1982	1981	1980
Spring	Nov 1	\$36.73	\$35.21	\$36.82	\$39.25	\$45.73
SEP-OCT	Jul 1	\$41.78	\$42.28	\$43.07	\$45.88	\$44.98
NOV-DEC	Sep 1	\$38.51	\$38.53	\$41.13	\$44.28	\$48.89
SEP-OCT	May 1	\$44.64	\$43.18	\$44.95	\$44.88	\$44.09
NOV-DEC	Jul 15	\$39.65	\$41.32	\$42.80	\$45.20	\$43.27
		1979	1978	1977	1976	1975
Spring	Nov 1	\$47.12	\$40.24	\$24.29	\$21.30	\$21.44
SEP-OCT	Jul 1	\$53.10	\$39.05	\$26.99	\$28.01	\$23.08
NOV-DEC	Sep 1	\$49.74	\$39.13	\$26.34	\$23.84	\$22.17
SEP-OCT	May 1	\$58.76	\$39.19	\$28.35	\$31.69	\$23.03
NOV-DEC	Jul 15	\$50.12	\$38.91	\$26.19	\$26.87	\$21.69

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\* It should be noted that weaning dates for the FEB-MAR and APR-MAY calving periods were November 1. The weaning dates for SEP-OCT at 7 and 9 month weaning were May 1 and July 1 respectively and for the NOV-DEC calving seasons, the weaning dates for 7.5 and 9 months were July 15 and September 1.

The tables of budget variables formed from the beef cowherd cost-return budgets used in this thesis are as follows:

TABLE 17.--Returns minus variable costs (Ret-VC) of various calving seasons

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	(\$65.24)	(\$94.20)	(\$89.78)	(\$93.32)	(\$126.10)	(\$117.81)	(\$65.71)	(\$78.84)
1976	(\$65.74)	(\$85.78)	(\$64.23)	(\$74.26)	(\$70.10)	(\$86.01)	(\$43.88)	(\$64.19)
1977	(\$53.03)	(\$75.56)	(\$71.15)	(\$65.18)	(\$90.81)	(\$88.75)	(\$41.60)	(\$45.60)
1978	\$81.55	\$38.32	\$40.34	\$56.48	(\$6.70)	\$23.83	\$60.67	\$68.71
1979	\$138.73	\$80.93	\$144.73	\$138.79	\$144.17	\$111.97	\$164.74	\$152.04
1980	\$81.96	\$27.65	\$54.83	\$69.69	\$5.78	\$8.98	\$73.81	\$79.63
1981	\$3.30	(\$39.56)	\$5.24	(\$1.94)	(\$31.84)	(\$34.94)	\$22.37	\$5.41
1982	(\$9.51)	(\$53.34)	(\$17.76)	(\$10.62)	(\$54.41)	(\$48.41)	(\$1.43)	(\$6.08)
1983	(\$19.64)	(\$59.09)	(\$16.17)	(\$57.57)	(\$37.78)	(\$55.23)	(\$1.38)	(\$53.05)
1984	(\$24.40)	(\$65.73)	(\$47.50)	(\$57.65)	(\$78.85)	(\$84.91)	(\$13.05)	(\$36.79)
AVERAGE	\$6.80	(\$32.64)	(\$6.15)	(\$9.56)	(\$34.66)	(\$37.13)	\$15.45	\$2.12
STDEV	\$70.41	\$59.90	\$70.96	\$75.73	\$74.18	\$68.62	\$68.74	\$75.12
+STDEV	\$77.21	\$27.27	\$64.81	\$66.18	\$39.52	\$31.49	\$84.20	\$77.24
-STDEV	(\$63.62)	(\$92.54)	(\$77.10)	(\$85.29)	(\$108.85)	(\$105.75)	(\$53.29)	(\$72.99)

Differences in RET-VC for FEB-MAR vs. Other calving seasons  
with various sized cowherds

	SPRING	FALL		FALL		FALL FESCUE	
Born :	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
RET-VC vs. FEB-MAR							
per cow	(\$39.43)	(\$12.94)	(\$16.36)	(\$41.46)	(\$43.93)	\$8.66	(\$4.67)
50 cows	(\$1,972)	(\$647)	(\$818)	(\$2,073)	(\$2,196)	\$433	(\$234)
100 cows	(\$3,943)	(\$1,294)	(\$1,636)	(\$4,146)	(\$4,393)	\$866	(\$467)
200 cows	(\$7,887)	(\$2,589)	(\$3,271)	(\$8,292)	(\$8,785)	\$1,731	(\$935)
500 cows	(\$19,717)	(\$6,472)	(\$8,178)	(\$20,731)	(\$21,963)	\$4,328	(\$2,337)
200 cows for ten yrs.	(\$78,868)	(\$25,886)	(\$32,712)	(\$82,924)	(\$87,852)	\$17,312	(\$9,348)

TABLE 18.--Returns minus total costs (Ret-TC) of various calving seasons

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	(\$192.04)	(\$221.00)	(\$216.57)	(\$220.11)	(\$252.89)	(\$244.60)	(\$192.51)	(\$205.64)
1976	(\$192.85)	(\$212.89)	(\$191.34)	(\$201.37)	(\$197.21)	(\$213.12)	(\$170.98)	(\$191.30)
1977	(\$182.55)	(\$205.09)	(\$200.67)	(\$194.70)	(\$220.33)	(\$218.27)	(\$171.12)	(\$175.12)
1978	(\$52.64)	(\$95.87)	(\$93.85)	(\$77.71)	(\$140.89)	(\$110.36)	(\$73.52)	(\$65.48)
1979	(\$8.66)	(\$66.46)	(\$2.66)	(\$8.60)	(\$3.22)	(\$35.42)	\$17.36	\$4.65
1980	(\$86.48)	(\$140.79)	(\$113.62)	(\$98.75)	(\$162.67)	(\$159.47)	(\$94.63)	(\$88.82)
1981	(\$175.27)	(\$218.13)	(\$173.33)	(\$180.51)	(\$210.41)	(\$213.51)	(\$156.20)	(\$173.16)
1982	(\$193.82)	(\$237.65)	(\$202.07)	(\$194.92)	(\$238.72)	(\$232.72)	(\$185.74)	(\$190.38)
1983	(\$189.79)	(\$229.24)	(\$186.32)	(\$227.72)	(\$207.93)	(\$225.38)	(\$171.53)	(\$223.20)
1984	(\$191.42)	(\$232.76)	(\$214.52)	(\$224.67)	(\$245.88)	(\$251.93)	(\$180.08)	(\$203.81)
AVERAGE	(\$146.55)	(\$185.99)	(\$159.50)	(\$162.91)	(\$188.02)	(\$190.48)	(\$137.90)	(\$151.23)
STDEV	\$69.84	\$61.94	\$68.90	\$74.76	\$73.91	\$69.08	\$67.36	\$75.01
+STDEV	(\$76.72)	(\$124.05)	(\$90.59)	(\$88.15)	(\$114.10)	(\$121.40)	(\$70.53)	(\$76.21)
-STDEV	(\$216.39)	(\$247.93)	(\$228.40)	(\$237.66)	(\$261.93)	(\$259.56)	(\$205.26)	(\$226.24)

TABLE 19.--Cow unit feed costs (CFC) of various calving seasons

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	\$140.69	\$125.59	\$162.85	\$156.39	\$162.85	\$156.39	\$140.11	\$142.71
1976	\$143.67	\$128.60	\$166.17	\$159.01	\$166.17	\$159.01	\$146.93	\$149.49
1977	\$148.22	\$131.36	\$171.92	\$165.39	\$171.92	\$165.39	\$143.99	\$146.88
1978	\$142.66	\$128.48	\$164.66	\$159.40	\$164.66	\$159.40	\$145.44	\$147.85
1979	\$155.07	\$141.61	\$178.23	\$174.15	\$178.23	\$174.15	\$159.37	\$161.66
1980	\$163.81	\$147.91	\$188.90	\$183.14	\$188.90	\$183.14	\$171.19	\$173.87
1981	\$168.27	\$149.97	\$194.79	\$188.86	\$194.79	\$188.86	\$178.92	\$182.05
1982	\$171.83	\$153.04	\$198.92	\$191.13	\$198.92	\$191.13	\$183.82	\$186.93
1983	\$166.57	\$149.43	\$192.41	\$185.65	\$192.41	\$185.65	\$178.60	\$181.43
1984	\$181.72	\$159.53	\$211.27	\$202.21	\$211.27	\$202.21	\$179.16	\$182.76
AVERAGE	\$158.25	\$141.55	\$183.01	\$176.53	\$183.01	\$176.53	\$162.75	\$165.56
STDEV	\$14.18	\$12.14	\$16.62	\$15.94	\$16.62	\$15.94	\$17.39	\$17.65
+STDEV	\$172.43	\$153.69	\$199.63	\$192.47	\$199.63	\$192.47	\$180.15	\$183.21
-STDEV	\$144.07	\$129.41	\$166.39	\$160.59	\$166.39	\$160.59	\$145.36	\$147.91

differences in  
cow unit feed costs vs. FEB-MAR

	(\$16.70)	\$24.76	\$18.28	\$24.76	\$18.28	\$4.50	\$7.31
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## COW UNIT FEED COSTS AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	100.00%	89.27%	115.75%	111.16%	115.75%	111.16%	99.59%	101.44%
1976	100.00%	89.51%	115.66%	110.68%	115.66%	110.68%	102.27%	104.05%
1977	100.00%	88.63%	115.99%	111.58%	115.99%	111.58%	97.15%	99.10%
1978	100.00%	90.06%	115.42%	111.73%	115.42%	111.73%	101.95%	103.64%
1979	100.00%	91.32%	114.94%	112.30%	114.94%	112.30%	102.77%	104.25%
1980	100.00%	90.29%	115.32%	111.80%	115.32%	111.80%	104.51%	106.14%
1981	100.00%	89.12%	115.76%	112.24%	115.76%	112.24%	106.33%	108.19%
1982	100.00%	89.06%	115.77%	111.23%	115.77%	111.23%	106.98%	108.79%
1983	100.00%	89.71%	115.51%	111.45%	115.51%	111.45%	107.22%	108.92%
1984	100.00%	87.79%	116.26%	111.28%	116.26%	111.28%	98.59%	100.57%
AVERAGE	100.00%	89.48%	115.64%	111.55%	115.64%	111.55%	102.74%	104.51%
STDEV	0.00%	0.96%	0.37%	0.50%	0.37%	0.50%	3.55%	3.48%
+STDEV	100.00%	90.44%	116.01%	112.04%	116.01%	112.04%	106.28%	107.99%
-STDEV	100.00%	88.51%	115.27%	111.05%	115.27%	111.05%	99.19%	101.02%

TABLE 20.--Total cow unit revenue of various calving seasons

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	\$173.10	\$128.16	\$177.38	\$167.00	\$141.06	\$142.51
1976	\$177.36	\$141.35	\$208.51	\$190.91	\$202.65	\$179.16
1977	\$198.41	\$158.04	\$210.87	\$209.93	\$191.21	\$186.36
1978	\$325.62	\$267.39	\$313.83	\$324.42	\$266.80	\$291.77
1979	\$408.96	\$336.88	\$446.97	\$436.70	\$446.41	\$409.88
1980	\$375.22	\$303.86	\$382.92	\$391.61	\$333.87	\$330.90
1981	\$310.87	\$248.26	\$349.52	\$335.94	\$312.44	\$302.95
1982	\$307.55	\$243.41	\$336.75	\$335.47	\$300.10	\$297.67
1983	\$293.29	\$235.48	\$334.21	\$285.58	\$312.60	\$287.91
1984	\$313.81	\$248.68	\$331.42	\$311.55	\$300.07	\$284.29
AVERAGE	\$288.42	\$231.15	\$309.24	\$298.91	\$280.72	\$271.34
STDEV	\$80.77	\$68.77	\$85.06	\$87.09	\$86.19	\$80.01
+STDEV	\$369.19	\$299.92	\$394.30	\$386.00	\$366.91	\$351.35
-STDEV	\$207.64	\$162.38	\$224.17	\$211.82	\$194.53	\$191.33
REVENUE vs FEB-MAR	(\$57.27)	\$20.82	\$10.49	(\$7.70)	(\$17.08)	

## TOTAL REVENUE AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	100.00%	74.04%	102.47%	96.48%	81.49%	82.33%
1976	100.00%	79.70%	117.56%	107.64%	114.26%	101.01%
1977	100.00%	79.65%	106.28%	105.81%	96.37%	93.93%
1978	100.00%	82.12%	96.38%	99.63%	81.94%	89.60%
1979	100.00%	82.37%	109.29%	106.78%	109.16%	100.22%
1980	100.00%	80.98%	102.05%	104.37%	88.98%	88.19%
1981	100.00%	79.86%	112.43%	108.06%	100.51%	97.45%
1982	100.00%	79.14%	109.49%	109.08%	97.58%	96.79%
1983	100.00%	80.29%	113.95%	97.37%	106.58%	98.17%
1984	100.00%	79.25%	105.61%	99.28%	95.62%	90.59%
AVERAGE	100.00%	79.74%	107.55%	103.45%	97.25%	93.83%
STDEV	0.00%	2.30%	6.31%	4.78%	10.97%	6.02%
+STDEV	100.00%	82.04%	113.86%	108.23%	108.22%	99.84%
-STDEV	100.00%	77.44%	101.25%	98.67%	86.28%	87.81%

TABLE 21.--Steer revenue of various calving seasons

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	\$92.42	\$64.69	\$91.48	\$85.72	\$69.43	\$70.52
1976	\$93.78	\$71.32	\$105.24	\$98.18	\$99.33	\$87.97
1977	\$102.86	\$78.11	\$107.27	\$108.50	\$95.99	\$93.38
1978	\$167.63	\$129.36	\$162.04	\$168.03	\$132.55	\$148.10
1979	\$213.86	\$167.04	\$228.26	\$232.28	\$228.07	\$213.68
1980	\$194.61	\$147.85	\$198.90	\$202.65	\$172.78	\$166.93
1981	\$158.77	\$120.69	\$176.63	\$170.07	\$155.76	\$149.44
1982	\$158.52	\$119.93	\$172.60	\$171.84	\$148.14	\$147.94
1983	\$154.09	\$117.84	\$170.91	\$144.23	\$158.90	\$142.23
1984	\$164.12	\$123.64	\$171.74	\$159.68	\$148.48	\$143.31
AVERAGE	\$150.07	\$114.05	\$158.51	\$154.12	\$140.94	\$136.35
STDEV	\$41.42	\$33.21	\$43.87	\$46.24	\$44.96	\$42.11
+STDEV	\$191.49	\$147.25	\$202.38	\$200.36	\$185.90	\$178.46
-STDEV	\$108.64	\$80.84	\$114.64	\$107.88	\$95.98	\$94.24
REVENUE vs FEB-MAR	(\$36.02)		\$8.44	\$4.05	(\$9.12)	(\$13.72)

## STEER REVENUE AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	100.00%	70.00%	98.98%	92.75%	75.12%	76.30%
1976	100.00%	76.05%	112.22%	104.69%	105.92%	93.80%
1977	100.00%	75.94%	104.29%	105.48%	93.32%	90.78%
1978	100.00%	77.17%	96.67%	100.24%	79.07%	88.35%
1979	100.00%	78.11%	106.73%	108.61%	106.64%	99.92%
1980	100.00%	75.97%	102.20%	104.13%	88.78%	85.78%
1981	100.00%	76.02%	111.25%	107.12%	98.10%	94.12%
1982	100.00%	75.66%	108.88%	108.40%	93.45%	93.33%
1983	100.00%	76.47%	110.92%	93.60%	103.12%	92.30%
1984	100.00%	75.34%	104.64%	97.29%	90.47%	87.32%
AVERAGE	100.00%	75.67%	105.68%	102.23%	93.40%	90.20%
STDEV	0.00%	2.15%	5.31%	5.92%	10.64%	6.34%
+STDEV	100.00%	77.82%	110.99%	108.15%	104.04%	96.54%
-STDEV	100.00%	73.52%	100.37%	96.31%	82.77%	83.86%



TABLE 22.--Heifer revenue of various calving seasons

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	\$45.31	\$28.10	\$47.82	\$44.70	\$33.64	\$36.20
1976	\$48.44	\$34.88	\$57.06	\$53.40	\$51.04	\$46.86
1977	\$55.47	\$39.85	\$59.07	\$57.97	\$48.45	\$49.77
1978	\$91.59	\$71.64	\$87.36	\$91.82	\$69.59	\$79.47
1979	\$117.35	\$92.09	\$131.09	\$122.35	\$121.39	\$113.50
1980	\$105.16	\$80.55	\$109.81	\$108.29	\$88.34	\$92.58
1981	\$87.34	\$62.81	\$97.18	\$92.81	\$82.62	\$78.93
1982	\$88.28	\$62.73	\$93.08	\$95.76	\$77.79	\$79.11
1983	\$81.10	\$59.54	\$93.54	\$77.78	\$82.45	\$77.50
1984	\$89.09	\$64.43	\$90.74	\$88.33	\$77.93	\$75.56
AVERAGE	\$80.91	\$59.66	\$86.68	\$83.32	\$73.32	\$72.95
STDEV	\$23.95	\$20.21	\$25.54	\$24.83	\$24.61	\$22.95
+STDEV	\$104.86	\$79.87	\$112.22	\$108.15	\$97.93	\$95.90
-STDEV	\$56.97	\$39.45	\$61.13	\$58.49	\$48.71	\$49.99
REVENUE vs FEB-MAR (\$21.25)			\$5.76	\$2.41	(\$7.59)	(\$7.96)

## HEIFER REVENUE AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	100.00%	62.02%	105.54%	98.65%	74.24%	79.89%
1976	100.00%	72.01%	117.80%	110.24%	105.37%	96.74%
1977	100.00%	71.84%	106.49%	104.51%	87.34%	89.72%
1978	100.00%	78.22%	95.38%	100.25%	75.98%	86.77%
1979	100.00%	78.47%	111.71%	104.26%	103.44%	96.72%
1980	100.00%	76.60%	104.42%	102.98%	84.01%	88.04%
1981	100.00%	71.91%	111.27%	106.26%	94.60%	90.37%
1982	100.00%	71.06%	105.44%	108.47%	88.12%	89.61%
1983	100.00%	73.42%	115.34%	95.91%	101.66%	95.56%
1984	100.00%	72.32%	101.85%	99.15%	87.47%	84.81%
AVERAGE	100.00%	72.79%	107.52%	103.07%	90.22%	89.82%
STDEV	0.00%	4.69%	6.64%	4.58%	10.91%	5.42%
+STDEV	100.00%	77.48%	114.16%	107.64%	101.13%	95.25%
-STDEV	100.00%	68.09%	100.88%	98.49%	79.31%	84.40%

TABLE 23.--Cull cow revenue of various calving seasons

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	\$35.38	\$35.38	\$38.08	\$36.58	\$38.00	\$35.79
1976	\$35.15	\$35.15	\$46.22	\$39.34	\$52.29	\$44.34
1977	\$40.08	\$40.08	\$44.53	\$43.46	\$46.78	\$43.21
1978	\$66.40	\$66.40	\$64.43	\$64.56	\$64.66	\$64.20
1979	\$77.75	\$77.75	\$87.62	\$82.07	\$96.95	\$82.70
1980	\$75.45	\$75.45	\$74.22	\$80.67	\$72.75	\$71.40
1981	\$64.76	\$64.76	\$75.70	\$73.06	\$74.05	\$74.58
1982	\$60.75	\$60.75	\$71.07	\$67.86	\$74.17	\$70.62
1983	\$58.10	\$58.10	\$69.76	\$63.57	\$71.25	\$68.18
1984	\$60.60	\$60.60	\$68.94	\$63.54	\$73.66	\$65.42
AVERAGE	\$57.44	\$57.44	\$64.06	\$61.47	\$66.46	\$62.04
STDEV	\$15.55	\$15.55	\$15.90	\$16.40	\$16.87	\$15.48
+STDEV	\$72.99	\$72.99	\$79.95	\$77.87	\$83.33	\$77.52
-STDEV	\$41.89	\$41.89	\$48.16	\$45.07	\$49.58	\$46.57
REVENUE vs FEB-MAR	\$0.00	\$0.00	\$6.62	\$4.03	\$9.01	\$4.60

CULL COW REVENUE AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	100.00%	100.00%	107.63%	103.39%	107.41%	101.16%
1976	100.00%	100.00%	131.49%	111.92%	148.76%	126.15%
1977	100.00%	100.00%	111.10%	108.43%	116.72%	107.81%
1978	100.00%	100.00%	97.03%	97.23%	97.38%	96.69%
1979	100.00%	100.00%	112.69%	105.56%	124.69%	106.37%
1980	100.00%	100.00%	98.37%	106.92%	96.42%	94.63%
1981	100.00%	100.00%	116.89%	112.82%	114.35%	115.16%
1982	100.00%	100.00%	116.99%	111.70%	122.09%	116.25%
1983	100.00%	100.00%	120.07%	109.41%	122.63%	117.35%
1984	100.00%	100.00%	113.76%	104.85%	121.55%	107.95%
AVERAGE	100.00%	100.00%	112.60%	107.22%	117.20%	108.95%
STDEV	0.00%	0.00%	10.13%	4.75%	15.11%	9.91%
+STDEV	100.00%	100.00%	122.73%	111.97%	132.31%	118.86%
-STDEV	100.00%	100.00%	102.47%	102.48%	102.09%	99.05%

TABLE 24.--Steer prices of various calving seasons

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	\$37.34	\$35.67	\$35.17	\$34.89	\$33.25	\$32.58
1976	\$37.89	\$39.33	\$40.46	\$39.96	\$47.57	\$40.64
1977	\$41.56	\$43.07	\$41.24	\$44.16	\$45.97	\$43.14
1978	\$67.73	\$71.33	\$62.30	\$68.39	\$63.48	\$68.42
1979	\$86.41	\$92.11	\$87.76	\$94.54	\$109.23	\$98.72
1980	\$78.63	\$81.53	\$76.47	\$82.48	\$82.75	\$77.12
1981	\$64.15	\$66.55	\$67.91	\$69.22	\$74.60	\$69.04
1982	\$64.05	\$66.13	\$66.36	\$69.94	\$70.95	\$68.35
1983	\$62.26	\$64.98	\$65.71	\$58.70	\$76.10	\$65.71
1984	\$66.31	\$68.18	\$66.03	\$64.99	\$71.11	\$66.21
AVERAGE	\$60.63	\$62.89	\$60.94	\$62.73	\$67.50	\$62.99
STDEV	\$16.74	\$18.31	\$16.87	\$18.82	\$21.53	\$19.46
+STDEV	\$77.37	\$81.20	\$77.81	\$81.55	\$89.03	\$82.45
-STDEV	\$43.90	\$44.58	\$44.07	\$43.91	\$45.97	\$43.54
PRICE vs FEB-MAR		\$2.25	\$0.31	\$2.09	\$6.87	\$2.36

## STEER PRICE AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	100.00%	95.53%	94.19%	93.44%	89.05%	87.25%
1976	100.00%	103.80%	106.78%	105.46%	125.55%	107.26%
1977	100.00%	103.63%	99.23%	106.26%	110.61%	103.80%
1978	100.00%	105.32%	91.98%	100.97%	93.73%	101.02%
1979	100.00%	106.60%	101.56%	109.41%	126.41%	114.25%
1980	100.00%	103.69%	97.25%	104.90%	105.24%	98.08%
1981	100.00%	103.74%	105.86%	107.90%	116.29%	107.62%
1982	100.00%	103.25%	103.61%	109.20%	110.77%	106.71%
1983	100.00%	104.37%	105.54%	94.28%	122.23%	105.54%
1984	100.00%	102.82%	99.58%	98.01%	107.24%	99.85%
AVERAGE	100.00%	103.27%	100.56%	102.98%	110.71%	103.14%
STDEV	0.00%	2.93%	5.05%	5.96%	12.61%	7.25%
+STDEV	100.00%	106.21%	105.61%	108.95%	123.32%	110.39%
-STDEV	100.00%	100.34%	95.51%	97.02%	98.10%	95.89%

TABLE 25.--Average calf breakeven prices (variable costs)

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	\$42.11	\$53.07	\$45.33	\$46.86	\$56.46	\$53.42	\$40.57	\$43.83
1976	\$43.15	\$54.49	\$44.83	\$47.30	\$54.31	\$52.54	\$40.80	\$45.19
1977	\$43.85	\$54.92	\$46.99	\$48.52	\$57.95	\$55.17	\$41.15	\$44.42
1978	\$36.87	\$46.17	\$41.37	\$42.60	\$51.45	\$48.47	\$37.35	\$40.03
1979	\$39.94	\$50.58	\$42.47	\$45.21	\$50.58	\$51.21	\$38.51	\$42.43
1980	\$45.19	\$56.98	\$50.24	\$50.53	\$62.91	\$59.61	\$46.48	\$48.45
1981	\$50.38	\$63.31	\$53.15	\$55.47	\$66.57	\$62.65	\$49.76	\$53.93
1982	\$53.18	\$66.98	\$56.09	\$58.27	\$69.07	\$65.54	\$52.86	\$57.32
1983	\$52.88	\$67.11	\$55.53	\$58.55	\$68.77	\$65.42	\$52.60	\$57.61
1984	\$57.60	\$72.03	\$61.34	\$64.02	\$75.21	\$72.28	\$54.52	\$59.65
AVERAGE	\$46.52	\$58.56	\$49.73	\$51.73	\$61.33	\$58.63	\$45.46	\$49.29
STDEV	\$6.65	\$8.35	\$6.62	\$6.95	\$8.40	\$7.69	\$6.55	\$7.20
+STDEV	\$53.17	\$66.91	\$56.35	\$58.69	\$69.73	\$66.32	\$52.01	\$56.48
-STDEV	\$39.86	\$50.21	\$43.11	\$44.78	\$52.93	\$50.94	\$38.91	\$42.09
BE(VC) vs. FEB-MAR		\$12.05	\$3.22	\$5.22	\$14.81	\$12.12	(\$1.05)	\$2.77

## CALF BREAKEVENS (VC) AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	100.00%	126.03%	107.65%	111.28%	134.08%	126.86%	96.34%	104.08%
1976	100.00%	126.28%	103.89%	109.62%	125.86%	121.76%	94.55%	104.73%
1977	100.00%	125.25%	107.16%	110.65%	132.16%	125.82%	93.84%	101.30%
1978	100.00%	125.22%	112.21%	115.54%	139.54%	131.46%	101.30%	108.57%
1979	100.00%	126.64%	106.33%	113.19%	126.64%	128.22%	96.42%	106.23%
1980	100.00%	126.09%	111.18%	111.82%	139.21%	131.91%	102.85%	107.21%
1981	100.00%	125.66%	105.50%	110.10%	132.14%	124.35%	98.77%	107.05%
1982	100.00%	125.95%	105.47%	109.57%	129.88%	123.24%	99.40%	107.78%
1983	100.00%	126.91%	105.01%	110.72%	130.05%	123.71%	99.47%	108.94%
1984	100.00%	125.05%	106.49%	111.15%	130.57%	125.49%	94.65%	103.56%
AVERAGE	100.00%	125.91%	107.09%	111.36%	132.01%	126.28%	97.76%	105.95%
STDEV	0.00%	0.62%	2.66%	1.82%	4.59%	3.39%	3.06%	2.46%
+STDEV	100.00%	126.53%	109.75%	113.18%	136.61%	129.67%	100.82%	108.41%
-STDEV	100.00%	125.29%	104.43%	109.54%	127.42%	122.89%	94.70%	103.49%

TABLE 26.--Average calf breakeven prices (total costs)

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	Weaned: NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	\$68.42	\$89.05	\$70.42	\$73.42	\$87.70	\$83.59	\$65.66	\$70.39
1976	\$69.52	\$90.56	\$69.98	\$73.92	\$85.63	\$82.78	\$65.95	\$71.81
1977	\$70.73	\$91.68	\$72.62	\$75.65	\$89.86	\$85.99	\$66.78	\$71.54
1978	\$64.71	\$84.25	\$67.92	\$70.70	\$84.51	\$80.40	\$63.90	\$68.14
1979	\$70.52	\$92.40	\$71.64	\$76.08	\$86.89	\$86.27	\$67.68	\$73.30
1980	\$80.14	\$104.78	\$83.57	\$85.81	\$104.41	\$99.68	\$79.81	\$83.73
1981	\$87.43	\$113.99	\$88.48	\$92.87	\$110.57	\$105.13	\$85.09	\$91.33
1982	\$91.43	\$119.29	\$92.56	\$96.87	\$114.47	\$109.39	\$89.33	\$95.92
1983	\$88.18	\$115.40	\$89.20	\$94.19	\$110.69	\$105.90	\$86.27	\$93.25
1984	\$92.26	\$119.44	\$94.39	\$99.00	\$116.36	\$112.02	\$87.58	\$94.63
AVERAGE	\$78.33	\$102.08	\$80.08	\$83.85	\$99.11	\$95.12	\$75.81	\$81.40
STDEV	\$10.69	\$13.93	\$10.52	\$11.05	\$13.28	\$12.43	\$10.66	\$11.46
+STDEV	\$89.03	\$116.01	\$90.60	\$94.90	\$112.39	\$107.54	\$86.46	\$92.86
-STDEV	\$67.64	\$88.15	\$69.56	\$72.80	\$85.83	\$82.69	\$65.15	\$69.94
BE(TC) vs. FEB-MAR	\$23.75	\$1.74	\$5.52	\$20.77	\$16.78	(\$2.53)	\$3.07	
Calf Breakevens (TC) as a % of Feb-Mar								
Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	Weaned: NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	100.00%	130.15%	102.92%	107.31%	128.18%	122.17%	95.97%	102.88%
1976	100.00%	130.26%	100.66%	106.33%	123.17%	119.07%	94.86%	103.29%
1977	100.00%	129.62%	102.67%	106.96%	127.05%	121.58%	94.42%	101.15%
1978	100.00%	130.20%	104.96%	109.26%	130.60%	124.25%	98.75%	105.30%
1979	100.00%	131.03%	101.59%	107.88%	123.21%	122.33%	95.97%	103.94%
1980	100.00%	130.75%	104.28%	107.08%	130.28%	124.38%	99.59%	104.48%
1981	100.00%	130.38%	101.20%	106.22%	126.47%	120.24%	97.32%	104.46%
1982	100.00%	130.47%	101.24%	105.95%	125.20%	119.64%	97.70%	104.91%
1983	100.00%	130.87%	101.16%	106.82%	125.53%	120.10%	97.83%	105.75%
1984	100.00%	129.46%	102.31%	107.31%	126.12%	121.42%	94.93%	102.57%
AVERAGE	100.00%	130.32%	102.30%	107.11%	126.58%	121.52%	96.73%	103.87%
STDEV	0.00%	0.50%	1.43%	0.95%	2.56%	1.82%	1.76%	1.41%
+STDEV	100.00%	130.82%	103.73%	108.06%	129.14%	123.34%	98.50%	105.28%
-STDEV	100.00%	129.81%	100.87%	106.16%	124.02%	119.70%	94.97%	102.47%

TABLE 27.--Average beef cowherd investment

Born :	SPRING		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
1975	\$3,228	\$3,220	\$3,512	\$3,509	\$3,301	\$3,302
1976	\$3,475	\$3,468	\$3,788	\$3,785	\$3,499	\$3,500
1977	\$3,714	\$3,706	\$4,053	\$4,050	\$3,732	\$3,733
1978	\$3,899	\$3,892	\$4,256	\$4,253	\$3,938	\$3,939
1979	\$4,437	\$4,431	\$4,852	\$4,850	\$4,445	\$4,447
1980	\$4,930	\$4,922	\$5,396	\$5,393	\$4,993	\$4,994
1981	\$5,176	\$5,167	\$5,671	\$5,668	\$5,208	\$5,209
1982	\$4,738	\$4,728	\$5,182	\$5,178	\$4,875	\$4,877
1983	\$4,464	\$4,455	\$4,880	\$4,876	\$4,574	\$4,575
1984	\$4,247	\$4,236	\$4,639	\$4,634	\$4,357	\$4,359
AVERAGE	\$4,231	\$4,223	\$4,623	\$4,620	\$4,292	\$4,294
STDEV	\$640	\$640	\$709	\$708	\$652	\$652
+STDEV	\$4,871	\$4,862	\$5,331	\$5,328	\$4,944	\$4,946
-STDEV	\$3,590	\$3,583	\$3,914	\$3,911	\$3,640	\$3,641
INV. vs. FEB-MAR		(\$8)	\$392	\$389	\$61	\$63

## INVESTMENT AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
1975	100.00%	99.75%	108.80%	108.71%	102.26%	102.29%
1976	100.00%	99.80%	109.01%	108.92%	100.69%	100.72%
1977	100.00%	99.78%	109.13%	109.05%	100.48%	100.51%
1978	100.00%	99.82%	109.16%	109.08%	101.00%	101.03%
1979	100.00%	99.86%	109.35%	109.31%	100.18%	100.23%
1980	100.00%	99.84%	109.45%	109.39%	101.28%	101.30%
1981	100.00%	99.83%	109.56%	109.51%	100.62%	100.64%
1982	100.00%	99.79%	109.37%	109.29%	102.89%	102.93%
1983	100.00%	99.80%	109.32%	109.23%	102.46%	102.49%
1984	100.00%	99.74%	109.23%	109.11%	102.59%	102.64%
AVERAGE	100.00%	99.80%	109.24%	109.16%	101.45%	101.48%
STDEV	0.00%	0.04%	0.22%	0.24%	1.01%	1.01%
+STDEV	100.00%	99.84%	109.46%	109.39%	102.45%	102.49%
-STDEV	100.00%	99.76%	109.01%	108.92%	100.44%	100.47%

TABLE 28.--Gross asset turnover (TR/Investment)

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	7.41%	6.03%	6.93%	6.64%	5.89%	5.94%	7.37%	7.05%
1976	7.00%	5.98%	7.25%	6.79%	7.09%	6.48%	7.85%	7.34%
1977	7.12%	6.05%	6.83%	6.82%	6.35%	6.23%	7.42%	7.40%
1978	10.08%	8.61%	8.96%	9.22%	7.86%	8.45%	9.69%	9.95%
1979	10.92%	9.31%	10.77%	10.56%	10.76%	10.01%	11.75%	11.52%
1980	9.46%	8.02%	8.78%	8.95%	7.87%	7.82%	9.49%	9.66%
1981	7.94%	6.75%	7.93%	7.70%	7.28%	7.12%	8.64%	8.38%
1982	8.76%	7.42%	8.57%	8.56%	7.87%	7.83%	9.11%	9.09%
1983	8.73%	7.45%	8.83%	7.83%	8.38%	7.88%	9.42%	8.35%
1984	9.60%	8.09%	9.17%	8.75%	8.50%	8.17%	9.77%	9.13%
AVERAGE	8.70%	7.37%	8.40%	8.18%	7.79%	7.59%	9.05%	8.79%
STDEV	1.33%	1.16%	1.20%	1.26%	1.34%	1.21%	1.32%	1.38%
+STDEV	10.03%	8.53%	9.61%	9.44%	9.12%	8.80%	10.37%	10.17%
-STDEV	7.37%	6.21%	7.20%	6.92%	6.45%	6.38%	7.73%	7.41%

## GROSS TURNOVER

vs FEB-MAR	-1.33%	-0.30%	-0.52%	-0.92%	-1.11%	0.35%	0.09%
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## ASSET TURNOVER

## TOTAL REVENUE/INVESTMENT AS A % OF FEB-MAR

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	100.00%	81.38%	93.52%	89.61%	79.49%	80.16%	99.46%	95.14%
1976	100.00%	85.43%	103.57%	97.00%	101.29%	92.57%	112.14%	104.86%
1977	100.00%	84.97%	95.93%	95.79%	89.19%	87.50%	104.21%	103.93%
1978	100.00%	85.42%	88.89%	91.47%	77.98%	83.83%	96.13%	98.71%
1979	100.00%	85.26%	98.63%	96.70%	98.53%	91.67%	107.60%	105.49%
1980	100.00%	84.78%	92.81%	94.61%	83.19%	82.66%	100.32%	102.11%
1981	100.00%	85.01%	99.87%	96.98%	91.69%	89.67%	108.82%	105.54%
1982	100.00%	84.70%	97.83%	97.72%	89.84%	89.38%	104.00%	103.77%
1983	100.00%	85.34%	101.15%	89.69%	95.99%	90.26%	107.90%	95.65%
1984	100.00%	84.27%	95.52%	91.15%	88.54%	85.10%	101.77%	95.10%
AVERAGE	100.00%	84.66%	96.77%	94.07%	89.57%	87.28%	104.24%	101.03%
STDEV	0.00%	1.21%	4.35%	3.25%	7.76%	4.15%	4.92%	4.42%
+STDEV	100.00%	85.86%	101.12%	97.32%	97.33%	91.43%	109.16%	105.46%
-STDEV	100.00%	83.45%	92.42%	90.82%	81.82%	83.13%	99.31%	96.61%

TABLE 29.--Net asset turnover (Rev-TC/Investment)

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	Weaned: NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	-3.91%	-4.81%	-4.29%	-4.39%	-5.32%	-5.09%	-3.83%	-4.23%
1976	-3.65%	-4.23%	-3.31%	-3.58%	-3.46%	-3.89%	-3.00%	-3.58%
1977	-3.13%	-3.75%	-3.32%	-3.17%	-3.80%	-3.76%	-2.81%	-2.92%
1978	0.38%	-0.73%	-0.62%	-0.24%	-1.72%	-1.01%	-0.15%	-0.05%
1979	1.50%	0.20%	1.50%	1.38%	1.49%	0.83%	2.09%	1.80%
1980	0.09%	-1.01%	-0.42%	-0.14%	-1.33%	-1.27%	-0.07%	-0.04%
1981	-1.45%	-2.28%	-1.29%	-1.41%	-1.94%	-2.00%	-1.07%	-1.40%
1982	-1.82%	-2.75%	-1.82%	-1.69%	-2.53%	-2.42%	-1.60%	-1.70%
1983	-2.09%	-2.98%	-1.84%	-2.69%	-2.28%	-2.64%	-1.64%	-2.77%
1984	-2.29%	-3.27%	-2.60%	-2.82%	-3.27%	-3.41%	-1.97%	-2.52%
AVERAGE	-1.64%	-2.56%	-1.80%	-1.88%	-2.42%	-2.47%	-1.41%	-1.74%
STDEV	1.80%	1.61%	1.70%	1.79%	1.81%	1.70%	1.72%	1.86%
+STDEV	0.16%	-0.95%	-0.11%	-0.08%	-0.61%	-0.76%	0.31%	0.12%
-STDEV	-3.43%	-4.17%	-3.50%	-3.67%	-4.22%	-4.17%	-3.12%	-3.60%
NET TURNOVER vs FEB-MAR		-0.92%	-0.16%	-0.24%	-0.78%	-0.83%	0.23%	-0.10%

TABLE 30.--Cow unit feed costs as a percent of total revenue (CFC/TR)

Born :	SPRING		FALL		FALL		FALL FESCUE	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
	Weaned: NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	81.28%	97.99%	91.81%	93.65%	115.45%	109.74%	78.99%	85.46%
1976	81.00%	90.98%	79.69%	83.29%	82.00%	88.75%	70.47%	78.30%
1977	74.70%	83.12%	81.53%	78.78%	89.91%	88.75%	68.28%	69.97%
1978	43.81%	48.05%	52.47%	49.13%	61.72%	54.63%	46.34%	45.57%
1979	37.92%	42.04%	39.88%	39.88%	39.93%	42.49%	35.66%	37.02%
1980	43.66%	48.68%	49.33%	46.77%	56.58%	55.35%	44.71%	44.40%
1981	54.13%	60.41%	55.73%	56.22%	62.34%	62.34%	51.19%	54.19%
1982	55.87%	62.87%	59.07%	56.97%	66.28%	64.21%	54.59%	55.72%
1983	56.79%	63.46%	57.57%	65.01%	61.55%	64.48%	53.44%	63.53%
1984	57.91%	64.15%	63.75%	64.90%	70.41%	71.13%	54.06%	58.66%
AVERAGE	58.71%	66.17%	63.08%	63.46%	70.62%	70.19%	55.77%	59.28%
STDEV	15.55%	18.82%	16.27%	17.25%	20.81%	20.04%	13.16%	15.36%
+STDEV	74.26%	85.00%	79.35%	80.71%	91.43%	90.22%	68.93%	74.64%
-STDEV	43.16%	47.35%	46.81%	46.21%	49.80%	50.15%	42.61%	43.92%



TABLE 31.—CPC/TR and profitability measures sorted by Ret-VC

CALVING SEASON	COW FEED COSTS / TOTAL REVENUE	TOTAL RETURNS - VAR. COSTS	TOTAL RETURNS - TOTAL COSTS	BREAKEYEN PRICES VARIABLE COSTS	CALF OVER TOTAL COSTS	YEAR
F:S-O/J1	35.66%	\$164.74	\$17.36	\$38.51	\$67.68	1979
F:N-D/S1	37.02%	\$152.04	\$4.65	\$42.43	\$73.30	1979
S-O/J1	39.88%	\$144.73	(\$2.66)	\$42.47	\$71.64	1979
S-O/M1	39.93%	\$144.17	(\$3.22)	\$50.58	\$86.89	1979
N-D/S1	39.88%	\$138.79	(\$8.60)	\$45.21	\$76.08	1979
F-M/N1	37.92%	\$138.73	(\$8.66)	\$39.94	\$70.52	1979
N-D/J15	42.49%	\$111.97	(\$35.42)	\$51.21	\$86.27	1979
F-M/N1	43.66%	\$81.96	(\$86.48)	\$45.19	\$80.14	1980
F-M/N1	43.81%	\$81.55	(\$52.64)	\$36.87	\$64.71	1978
A-M/N1	42.04%	\$80.93	(\$66.46)	\$50.58	\$92.40	1979
F:N-D/S1	44.40%	\$79.63	(\$88.82)	\$48.45	\$83.73	1980
F:S-O/J1	44.71%	\$73.81	(\$94.63)	\$46.48	\$79.81	1980
N-D/S1	46.77%	\$69.69	(\$98.75)	\$50.53	\$85.81	1980
F:N-D/S1	45.57%	\$68.71	(\$65.48)	\$40.03	\$68.14	1978
F:S-O/J1	46.34%	\$60.67	(\$73.52)	\$37.35	\$63.90	1978
N-D/S1	49.13%	\$56.48	(\$77.71)	\$42.60	\$70.70	1978
S-O/J1	49.33%	\$54.83	(\$113.62)	\$50.24	\$83.57	1980
S-O/J1	52.47%	\$40.34	(\$93.85)	\$41.37	\$67.92	1978
A-M/N1	48.05%	\$38.32	(\$95.87)	\$46.17	\$84.25	1978
A-M/N1	48.68%	\$27.65	(\$140.79)	\$56.98	\$104.78	1980
N-D/J15	54.63%	\$23.83	(\$110.36)	\$48.47	\$80.40	1978
F:S-O/J1	51.19%	\$22.37	(\$156.20)	\$49.76	\$85.09	1981
N-D/J15	55.35%	\$8.98	(\$159.47)	\$59.61	\$99.68	1980
S-O/M1	56.58%	\$5.78	(\$162.67)	\$62.91	\$104.41	1980
F:N-D/S1	54.19%	\$5.41	(\$173.16)	\$53.93	\$91.33	1981
S-O/J1	55.73%	\$5.24	(\$173.33)	\$53.15	\$88.48	1981
F-M/N1	54.13%	\$3.30	(\$175.27)	\$50.38	\$87.43	1981
F:S-O/J1	53.44%	(\$1.38)	(\$171.53)	\$52.60	\$86.27	1983
F:S-O/J1	54.59%	(\$1.43)	(\$185.74)	\$52.86	\$89.33	1982
N-D/S1	56.22%	(\$1.94)	(\$180.51)	\$55.47	\$92.87	1981
F:N-D/S1	55.72%	(\$6.08)	(\$190.38)	\$57.32	\$95.92	1982
S-O/M1	61.72%	(\$6.70)	(\$140.89)	\$51.45	\$84.51	1978
F-M/N1	55.87%	(\$9.51)	(\$193.82)	\$53.18	\$91.43	1982
N-D/S1	56.97%	(\$10.62)	(\$194.92)	\$58.27	\$96.87	1982
F:S-O/J1	54.06%	(\$13.05)	(\$180.08)	\$54.52	\$87.58	1984
S-O/J1	57.57%	(\$16.17)	(\$186.32)	\$55.53	\$89.20	1983
S-O/J1	59.07%	(\$17.76)	(\$202.07)	\$56.09	\$92.56	1982
F-M/N1	56.79%	(\$19.64)	(\$189.79)	\$52.88	\$88.18	1983
F-M/N1	57.91%	(\$24.40)	(\$191.42)	\$57.60	\$92.26	1984

Note: F-M/N1 = Born FEB-MAR / Weaned Nov 1  
 A-M/N1 = Born APR-MAY / Weaned Nov 1  
 S-O/J1 = Born SEP-OCT / Weaned Jul 1  
 S-O/M1 = Born SEP-OCT / Weaned May 1  
 N-D/S1 = Born NOV-DEC / Weaned Sep 1  
 N-D/J15 = Born NOV-DEC / Weaned Jul 15  
 F:S-O/J1 = Born SEP-OCT / Weaned Jul 1 (FESCUE)  
 F:N-D/S1 = Born NOV-DEC / Weaned Sep 1 (FESCUE)

TABLE 31.—Continued.CFC/TR and profitability measures sorted by Ret-VC

CALVING SEASON	COW FEED COSTS /	TOTAL RETURNS	TOTAL RETURNS	BREAKEVEN PRICES	CALF OVER	YEAR
	TOTAL REVENUE	- VAR. COSTS	- TOTAL COSTS	VARIABLE COSTS	TOTAL COSTS	
S-O/M1	62.34%	(\$31.84)	(\$210.41)	\$66.57	\$110.57	1981
N-D/J15	62.34%	(\$34.94)	(\$213.51)	\$62.65	\$105.13	1981
F:N-D/S1	58.66%	(\$36.79)	(\$203.81)	\$59.65	\$94.63	1984
S-O/M1	61.55%	(\$37.78)	(\$207.93)	\$68.77	\$110.69	1983
A-M/N1	60.41%	(\$39.56)	(\$218.13)	\$63.31	\$113.99	1981
F:S-O/J1	68.28%	(\$41.60)	(\$171.12)	\$41.15	\$66.78	1977
F:S-O/J1	70.47%	(\$43.88)	(\$170.98)	\$40.80	\$65.95	1976
F:N-D/S1	69.97%	(\$45.60)	(\$175.12)	\$44.42	\$71.54	1977
S-O/J1	63.75%	(\$47.50)	(\$214.52)	\$61.34	\$94.39	1984
N-D/J15	64.21%	(\$48.41)	(\$232.72)	\$65.54	\$109.39	1982
F-M/N1	74.70%	(\$53.03)	(\$182.55)	\$43.85	\$70.73	1977
F:N-D/S1	63.53%	(\$53.05)	(\$223.20)	\$57.61	\$93.25	1983
A-M/N1	62.87%	(\$53.34)	(\$237.65)	\$66.98	\$119.29	1982
S-O/M1	66.28%	(\$54.41)	(\$238.72)	\$69.07	\$114.47	1982
N-D/J15	64.48%	(\$55.23)	(\$225.38)	\$65.42	\$105.90	1983
N-D/S1	65.01%	(\$57.57)	(\$227.72)	\$58.55	\$94.19	1983
N-D/S1	64.90%	(\$57.65)	(\$224.67)	\$64.02	\$99.00	1984
A-M/N1	63.46%	(\$59.09)	(\$229.24)	\$67.11	\$115.40	1983
F:N-D/S1	78.30%	(\$64.19)	(\$191.30)	\$45.19	\$71.81	1976
S-O/J1	79.69%	(\$64.23)	(\$191.34)	\$44.83	\$69.98	1976
N-D/S1	78.78%	(\$65.18)	(\$194.70)	\$48.52	\$75.65	1977
F-M/N1	81.28%	(\$65.24)	(\$192.04)	\$42.11	\$68.42	1975
F:S-O/J1	78.99%	(\$65.71)	(\$192.51)	\$40.57	\$65.66	1975
A-M/N1	64.15%	(\$65.73)	(\$232.76)	\$72.03	\$119.44	1984
F-M/N1	81.00%	(\$65.74)	(\$192.85)	\$43.15	\$69.52	1976
S-O/M1	82.00%	(\$70.10)	(\$197.21)	\$54.31	\$85.63	1976
S-O/J1	81.53%	(\$71.15)	(\$200.67)	\$46.99	\$72.62	1977
N-D/S1	83.29%	(\$74.26)	(\$201.37)	\$47.30	\$73.92	1976
A-M/N1	83.12%	(\$75.56)	(\$205.09)	\$54.92	\$91.68	1977
F:N-D/S1	85.46%	(\$78.84)	(\$205.64)	\$43.83	\$70.39	1975
S-O/M1	70.41%	(\$78.85)	(\$245.88)	\$75.21	\$116.36	1984
N-D/J15	71.13%	(\$84.91)	(\$251.93)	\$72.28	\$112.02	1984
A-M/N1	90.98%	(\$85.78)	(\$212.89)	\$54.49	\$90.56	1976
N-D/J15	88.75%	(\$86.01)	(\$213.12)	\$52.54	\$82.78	1976
N-D/J15	88.75%	(\$88.75)	(\$218.27)	\$55.17	\$85.99	1977
S-O/J1	91.81%	(\$89.78)	(\$216.57)	\$45.33	\$70.42	1975
S-O/M1	89.91%	(\$90.81)	(\$220.33)	\$57.95	\$89.86	1977
N-D/S1	93.65%	(\$93.32)	(\$220.11)	\$46.86	\$73.42	1975
A-M/N1	97.99%	(\$94.20)	(\$221.00)	\$53.07	\$89.05	1975
N-D/J15	109.74%	(\$117.81)	(\$244.60)	\$53.42	\$83.59	1975
S-O/M1	115.45%	(\$126.10)	(\$252.89)	\$56.46	\$87.70	1975

TABLE 32.--Average calf price per pound produced (AP/PP Cwt)\*

Born :	SPRING		FALL		FALL	
	FEB-MAR	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15
1975	\$28.57	\$26.36	\$27.58	\$27.34	\$25.38	\$25.41
1976	\$29.50	\$30.17	\$32.14	\$31.78	\$37.03	\$32.10
1977	\$32.85	\$33.51	\$32.94	\$34.90	\$35.57	\$34.08
1978	\$53.78	\$57.10	\$49.39	\$54.48	\$49.79	\$54.18
1979	\$68.72	\$73.62	\$71.16	\$74.35	\$86.07	\$77.90
1980	\$62.19	\$64.89	\$61.13	\$65.19	\$64.32	\$61.79
1981	\$51.06	\$52.13	\$54.22	\$55.11	\$58.72	\$54.37
1982	\$51.20	\$51.89	\$52.61	\$56.10	\$55.65	\$54.06
1983	\$48.79	\$50.39	\$52.37	\$46.54	\$59.45	\$52.32
1984	\$52.53	\$53.43	\$51.98	\$51.99	\$55.77	\$52.11

Average prices as a % of Feb-Mar

Born :	SPRING		FALL		FALL	
	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	
Weaned:	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	
1975	92.25%	96.54%	95.69%	88.84%	88.93%	
1976	102.26%	108.92%	107.70%	125.52%	108.80%	
1977	102.02%	100.27%	106.24%	108.30%	103.76%	
1978	106.17%	91.83%	101.30%	92.58%	100.75%	
1979	107.13%	103.55%	108.19%	125.26%	113.37%	
1980	104.34%	98.29%	104.81%	103.41%	99.35%	
1981	102.10%	106.19%	107.93%	115.00%	106.49%	
1982	101.35%	102.75%	109.57%	108.68%	105.58%	
1983	103.27%	107.32%	95.39%	121.83%	107.22%	
1984	101.71%	98.94%	98.97%	106.15%	99.20%	

AVERAGE	102.26%	101.46%	103.58%	109.56%	103.34%
STDEV	4.03%	5.30%	5.35%	12.70%	6.73%
+STDEV	106.28%	106.77%	108.93%	122.25%	110.08%
-STDEV	98.23%	96.16%	98.23%	96.86%	96.61%

\* AP/PP = TR - Cull cow revenue / lbs of calf produced

TABLE 33.--Average calf prices needed to equal FEB-MAR calving period profitability (PN)\*

Born :	=====						
	SPRING	FALL		FALL		FALL FESCUE	
	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	\$34.59	\$32.44	\$33.23	\$40.37	\$37.93	\$27.68	\$30.19
1976	\$35.86	\$31.84	\$33.56	\$38.11	\$36.93	\$27.81	\$31.45
1977	\$39.91	\$36.53	\$37.45	\$44.88	\$42.59	\$30.68	\$33.34
1978	\$69.38	\$57.55	\$59.73	\$71.52	\$67.93	\$53.52	\$57.17
1979	\$90.04	\$69.97	\$74.33	\$84.73	\$84.27	\$66.01	\$71.56
1980	\$80.32	\$66.50	\$67.76	\$83.08	\$79.16	\$62.74	\$65.68
1981	\$64.31	\$53.84	\$56.21	\$67.37	\$63.48	\$50.45	\$54.67
1982	\$64.34	\$54.24	\$56.34	\$66.71	\$63.32	\$51.01	\$55.38
1983	\$61.60	\$51.68	\$54.49	\$63.91	\$60.79	\$48.75	\$53.55
1984	\$65.17	\$56.55	\$58.96	\$69.18	\$66.52	\$49.73	\$54.59
Born :	PRICES NEEDED TO EQUAL FEB-MAR AS A % OF FEB-MAR PRICES						
	SPRING	FALL		FALL		FALL FESCUE	
	APR-MAY	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC	SEP-OCT	NOV-DEC
Weaned:	NOV 1	JUL 1	SEP 1	MAY 1	JUL 15	JUL 1	SEP 1
1975	121.04%	113.55%	116.29%	141.30%	132.74%	96.87%	105.67%
1976	121.55%	107.91%	113.75%	129.16%	125.16%	94.25%	106.60%
1977	121.50%	111.20%	114.00%	136.62%	129.65%	93.38%	101.50%
1978	129.01%	107.00%	111.07%	132.99%	126.30%	99.52%	106.30%
1979	131.03%	101.83%	108.18%	123.31%	122.64%	96.06%	104.13%
1980	129.14%	106.93%	108.95%	133.58%	127.28%	100.88%	105.60%
1981	125.94%	105.44%	110.09%	131.95%	124.32%	98.80%	107.07%
1982	125.66%	105.94%	110.02%	130.28%	123.67%	99.62%	108.16%
1983	126.24%	105.91%	111.68%	130.99%	124.58%	99.91%	109.74%
1984	124.06%	107.65%	112.24%	131.68%	126.62%	94.66%	103.92%
AVERAGE	125.52%	107.33%	111.63%	132.19%	126.30%	97.40%	105.87%
STDEV	3.50%	3.20%	2.51%	4.70%	3.02%	2.70%	2.32%
+STDEV	129.02%	110.53%	114.14%	136.89%	129.32%	100.09%	108.19%
-STDEV	122.02%	104.13%	109.12%	127.49%	123.27%	94.70%	103.55%

\* PN = Ret-VC for FEB-MAR - Ret-VC for the other calving season /  
the lbs of calf produced in the other calving period + the  
AP/PP of the other calving season

In the analysis of retained ownership strategies, the budgeting technique was again the primary analytical tool. A budget for retained ownership programs was constructed utilizing the Lotus 123 electronic spreadsheet software program on a Zenith Z-150 microcomputer. The budget format was similar to that of the beef cowherd cost-return budget and an example is illustrated in Table 34.

A more detailed explanation of the factors used to calculate the retained ownership budget is now appropriate. Rations and steer performance were based on conversations with Kansas State University Extension Animal Scientists, Dr. Larry Corah and Dr. Gerry Kuhl. Ration prices were based on Kansas monthly average feed prices over the time periods in which each retained ownership program took place. Labor hours for each program were derived from KSU Farm Management Guides. Wages represented hourly pay received by livestock workers as quoted for the month of January by the Kansas Crop-Livestock Reporting Service. All other variable costs and fixed costs were based on the average of costs incurred by farms with beef backgrounding operations enrolled in Kansas Farm Management Associations for each year of the analysis. Steer prices were monthly average prices around the sale date for choice medium framed feeder steers from Kansas City. Tables 35-37 summarize the feed prices, calf prices and variable and fixed costs used in the retained ownership budgets. Tables 38-42 combine the returns minus variable costs for the retained ownership phase with those of the cow-calf phase and

show the total returns for each calving season management strategy.

TABLE 34.--Steer grower budget

1984

PROGRAM: compares steer grower budgets for  
various starting weights & rates of gain

## Calf Data

Calving Season :	FEB-MAR	FEB-MAR	APR-MAY	APR-MAY
Date Weaned :	NOV 1	NOV 1	NOV 1	NOV 1
Age in Months :	8	8	6	6
Date On Feed :	NOV 1	NOV 1	NOV 1	NOV 1
Date Off Feed :	APR 25	APR 25	APR 25	APR 25

## PRODUCTION DATA

Starting Weight :	550	550	403	403
Expected ADG :	1.25	2.25	1.25	2.25
Days On Hand :	175	175	175	175
Lbs. Produced :	219	394	219	394
Ending Weight :	769	944	622	797
Purchase Price :	\$66.31	\$66.31	\$68.18	\$68.18
Sale Price :	\$63.96	\$61.45	\$67.13	\$63.96
Death Loss % :	1.5%	1.5%	2.5%	2.5%

## COST DATA

1.Labor	\$7.35	\$7.35	\$7.35	\$7.35
2.Feed	\$138.91	\$160.21	\$111.06	\$128.06
3.Repairs-Tools-Supplies	\$4.91	\$4.91	\$4.91	\$4.91
4.Vet.-Medicine-Drugs	\$6.60	\$6.60	\$6.60	\$6.60
5.Marketing	\$3.01	\$3.01	\$3.01	\$3.01
6.Gas-Fuel-Oil	\$3.01	\$3.01	\$3.01	\$3.01
7.Utilities	\$2.48	\$2.48	\$2.48	\$2.48
8.Auto Expense	\$0.49	\$0.49	\$0.49	\$0.49
9.Misc.	\$2.50	\$2.50	\$2.50	\$2.50
10.Interest (Calf & 1/2 VC)	\$31.67	\$32.42	\$24.35	\$24.95

A.TOTAL VARIABLE COSTS	\$200.93	\$222.99	\$165.76	\$183.36
B.TOTAL FIXED COSTS	\$51.28	\$51.28	\$51.28	\$51.28
C.TOTAL COSTS (A+B)	\$252.21	\$274.27	\$217.04	\$234.64

## RETURNS

a.Feeder Sales -----	\$491.71	\$579.93	\$417.35	\$509.62
b.Feeder Cost -----	\$364.71	\$364.71	\$274.77	\$274.77
c.Death Loss -----	\$5.47	\$5.47	\$6.87	\$6.87
D.GROSS RETURNS (a-(b+c))	\$121.54	\$209.76	\$135.72	\$227.99

## ANALYSIS

E.RETURNS-VARIABLE COSTS (D-A) (\$79.39)	(\$13.23)	(\$30.04)	\$44.63
F.RETURNS-TOTAL COSTS (D-C)	(\$130.67)	(\$64.51)	(\$81.32)
G.FEED COST/CWT. GAIN	\$63.50	\$40.69	\$50.77
H.SELL BREAK-EVEN/VAR. COST	\$73.58	\$62.27	\$70.85
I.SELL BREAK-EVEN/TOTAL COST	\$80.25	\$67.71	\$79.10
J.ACTUAL MARGIN (Sell-Buy)	(\$2.35)	(\$4.86)	(\$1.06)
K.BE/VC MARGIN	\$7.27	(\$4.04)	\$2.67
L.BE/TC MARGIN	\$13.94	\$1.40	\$10.92

TABLE 34.--Continued. Steer grower budget  
-budget input factors

1984

## CALF DATA

Date Born :	FEB-MAR	FEB-MAR	APR-MAY	APR-MAY
Date Weaned :	NOV 1	NOV 1	NOV 1	NOV 1
Age in Months :	8	8	6	6
Date On Feed :	NOV 1	NOV 1	NOV 1	NOV 1

## PRODUCTION DATA

Starting Weight :	550	550	403	403
Expected ADG :	1.25	2.25	1.25	2.25
Days On Hand :	175	175	175	175
Purchase Price :	\$66.31	\$66.31	\$68.18	\$68.18
Sale Price :	\$63.96	\$61.45	\$67.13	\$63.96
Death Loss % :	1.5%	1.5%	2.5%	2.5%

## COST DATA

I. FEED		AMOUNT	AMOUNT	AMOUNT	AMOUNT
(UNIT & PRICE)		(Pounds fed per day)			
a. Alfalfa Hay (Tons)	\$80.00	16.3	12.4	12.7	9.7
b. Milo (Cwt)	\$4.80	0.5	6.0	0.2	4.5
c. P-V-M Supp. *(Cwt)	\$11.40	1.0	1.0	1.0	1.0
d. Processing	\$0.25				

## II. MISC. COST FACTORS (Held Constant)

## A. VARIABLE COSTS

a. Labor Hours	\$4.20	1.75
b. Repairs-Tools-Supplies		\$4.91
c. Vet.-Medicine-Drugs		\$6.60
d. Marketing		\$3.01
e. Gas-Fuel-Oil		\$3.01
f. Utilities		\$2.48
g. Auto Expense		\$0.49
h. Misc.		\$2.50
i. Operating Interest Rate		14.50%

## B. FIXED COSTS \$51.28

## III. STEER PRICES

A. January 15	\$68.42	\$67.85	\$70.59	\$69.10
B. February 15	\$69.08	\$68.70	\$72.20	\$69.08
C. March 15	\$65.78	\$63.52	\$72.12	\$65.78

\* Protein-Vitamin-Mineral Supplement

NOTE: Variable costs (b-h) & fixed costs were based on the average of costs incurred by farms with beef backgrounding operations, enrolled in KS Farm Management Associations for each year of the analysis.

: Feed prices were obtained from KS Crop-Liv. Rep. Ser. data.

: Livestock prices are monthly average prices around the sale date for choice medium framed feeder steers from Kansas City.

: Rations & steer performance were based on conversations with Kansas State University Animal Scientists.



TABLE 35.--Input prices held constant among retained ownership budgets

Year	1984	1983	1982	1981	1980
1. Range Rent	\$12.80	\$12.80	\$12.80	\$12.40	\$12.90
2. Mineral-Salt Price	5.83	5.81	5.80	5.52	5.11
3. Wages	4.20	4.57	3.77	3.74	3.70
4. Repairs-Tools-Supplies	4.91	5.83	6.11	5.40	5.20
5. Vet.-Medicine-Drugs	6.60	6.05	6.02	6.29	5.70
6. Marketing	3.01	3.98	5.22	2.87	4.08
7. Gas-Fuel-Oil	3.01	3.65	3.12	4.11	2.90
8. Utilities	2.48	2.53	2.74	2.50	1.80
9. Auto Expense	0.49	0.56	0.54	0.45	0.54
10. Misc.	2.50	2.07	6.90	2.61	0.93
11. P-V-M Price	11.40	9.12	9.49	11.40	9.12
12. Operating Interest Rate	14.50%	14.15%	16.23%	15.91%	14.46%
13. Fixed Costs	51.28	60.03	56.06	51.04	33.03

Year	1979	1978	1977	1976	1975
1. Range Rent	\$12.80	\$11.10	\$10.70	\$10.90	\$10.50
2. Mineral-Salt Price	4.43	4.20	3.94	3.75	3.56
3. Wages	3.50	2.91	2.60	2.76	2.53
4. Repairs-Tools-Supplies	5.59	3.92	3.23	4.18	4.21
5. Vet.-Medicine-Drugs	4.87	3.79	2.98	1.04	0.81
6. Marketing	2.09	2.16	2.71	3.29	4.46
7. Gas-Fuel-Oil	1.29	1.04	1.45	1.70	1.48
8. Utilities	1.98	1.59	1.54	2.06	1.79
9. Auto Expense	0.46	0.46	0.53	0.66	0.50
10. Misc.	2.27	1.29	0.57	0.73	0.61
11. P-V-M Price	8.74	7.98	9.12	6.46	7.37
12. Operating Interest Rate	12.28%	11.58%	11.58%	11.70%	11.70%
13. Fixed Costs	30.40	27.76	25.53	24.89	24.28

TABLE 36.--Feed prices for beef backgrounding budgets

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<u>Calving Season Management Options*</u>					
	1984	1983	1982	1981	1980
Feb-Mar/Alfalfa	\$80.00	\$86.00	\$61.50	\$56.00	\$72.00
Feb-Mar/Milo	4.80	4.82	4.29	3.87	5.22
Apr-May/Alfalfa	\$80.00	\$86.00	\$61.50	\$56.00	\$72.00
Apr-May/Milo	4.80	4.82	4.29	3.87	5.22
Sept-Oct/Alfalfa	\$74.00	\$65.33	\$53.50	\$60.33	\$56.50
Sept-Oct/Milo	4.51	5.19	4.13	4.41	5.02
Nov-Dec/7.5 mo./Alf.	\$77.20	\$72.00	\$53.50	\$59.20	\$62.20
Nov-Dec/7.5 mo./Milo	4.29	5.11	3.98	4.16	5.16
Nov-Dec/9 mo./Alfalfa	\$80.66	\$79.00	\$53.50	\$58.66	\$68.17
Nov-Dec/9 mo. Milo	4.03	5.05	3.88	3.83	5.29
	1979	1978	1977	1976	1975
Feb-Mar/Alfalfa	\$52.33	\$56.17	\$39.83	\$61.50	\$53.42
Feb-Mar/Milo	3.85	3.37	3.12	3.36	3.96
Apr-May/Alfalfa	\$52.33	\$56.17	\$39.83	\$61.50	\$53.42
Apr-May/Milo	3.85	3.37	3.12	3.36	3.96
Sept-Oct/Alfalfa	\$49.33	\$38.33	\$43.50	\$51.83	\$47.75
Sept-Oct/Milo	4.10	3.30	2.63	4.13	4.54
Nov-Dec/7.5 mo./Alf.	\$49.90	\$42.80	\$41.90	\$54.00	\$48.50
Nov-Dec/7.5 mo./Milo	4.00	3.32	2.72	3.78	4.32
Nov-Dec/9 mo./Alfalfa	\$50.17	\$47.50	\$41.00	\$55.83	\$48.67
Nov-Dec/9 mo./Milo	3.89	3.31	2.74	3.50	4.19
-----					

\* Feb-Mar backgrounding takes place Nov-Apr  
 Apr-May backgrounding takes place Nov-Apr  
 Sep-Oct backgrounding takes place Jul-Sep  
 Nov-Dec/7.5 mos. backgrounding takes place Jul-Nov  
 Nov-Dec/9 mos. backgrounding takes place Sep-Dec

TABLE 37.--Steer prices for retained ownership budgets

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PURCHASE PRICES

Calving Season Management Strategies

	1984	1983	1982	1981	1980
FEB-MAR	\$66.31	\$62.26	\$64.05	\$64.15	\$78.63
APR-MAY	\$68.18	\$64.98	\$66.13	\$66.55	\$81.53
SEP-OCT/7 mo.	\$71.11	\$76.10	\$70.95	\$74.60	\$82.75
SEP-OCT/9 mo.	\$66.03	\$65.71	\$66.36	\$67.91	\$76.47
NOV-DEC/7.5 mo.	\$66.21	\$65.71	\$68.35	\$69.04	\$77.12
NOV-DEC/9 mo.	\$64.99	\$58.70	\$69.94	\$69.22	\$82.48
	1979	1978	1977	1976	1975
FEB-MAR	\$86.41	\$67.73	\$41.56	\$37.89	\$37.34
APR-MAY	\$92.11	\$71.33	\$43.07	\$39.33	\$35.67
SEP-OCT/7 mo.	\$109.23	\$63.48	\$45.97	\$47.57	\$33.25
SEP-OCT/9 mo.	\$87.76	\$62.30	\$41.24	\$40.46	\$35.17
NOV-DEC/7.5 mo.	\$98.72	\$68.42	\$43.14	\$40.64	\$32.58
NOV-DEC/9 mo.	\$94.54	\$68.39	\$44.16	\$39.96	\$34.89

## SALE PRICES

Calving Season Management Strategies

	1984	1983	1982	1981	1980
FEB-MAR/1.25 ADG	\$66.62	\$65.84	\$67.26	\$65.57	\$66.93
FEB-MAR/2.25 ADG	\$69.40	\$65.30	\$65.35	\$62.45	\$69.18
APR-MAY/1.25 ADG	\$62.00	\$60.56	\$64.28	\$63.93	\$71.19
APR-MAY/2.25 ADG	\$66.80	\$66.30	\$67.54	\$65.30	\$66.10
SEP-OCT/7 mo.	\$63.15	\$57.63	\$64.78	\$65.57	\$72.50
SEP-OCT/9 mo.	\$63.36	\$57.31	\$65.38	\$65.57	\$73.26
NOV-DEC/7.5 mo.	\$64.55	\$60.24	\$62.72	\$63.10	\$72.50
NOV-DEC/9 mo.	\$65.34	\$61.30	\$62.48	\$62.95	\$72.50
	1979	1978	1977	1976	1975
FEB-MAR/1.25 ADG	\$66.30	\$83.35	\$53.09	\$39.79	\$43.19
FEB-MAR/2.25 ADG	\$76.65	\$72.85	\$44.31	\$36.22	\$38.14
APR-MAY/1.25 ADG	\$75.50	\$55.37	\$39.32	\$39.89	\$37.04
APR-MAY/2.25 ADG	\$67.47	\$82.56	\$52.37	\$38.30	\$41.39
SEP-OCT/7 mo.	\$79.46	\$62.73	\$39.77	\$34.17	\$39.30
SEP-OCT/9 mo.	\$79.75	\$62.33	\$39.62	\$35.38	\$38.69
NOV-DEC/7.5 mo.	\$79.39	\$61.75	\$39.16	\$35.30	\$38.88
NOV-DEC/9 mo.	\$80.28	\$64.31	\$39.37	\$35.59	\$39.55

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TABLE 38.--Feb-Mar retained ownership; cumulative  
returns-variable costs @ 750 lbs

OPTION 1	COW/CALF	BACKGROUND 2.25/ADG	CUMULATIVE RET-VC
1975	(\$65.24)	\$2.80	(\$62.44)
1976	(\$65.74)	(\$15.32)	(\$81.06)
1977	(\$53.03)	\$36.16	(\$16.87)
1978	\$81.55	\$90.25	\$171.80
1979	\$138.73	\$7.16	\$145.89
1980	\$81.96	(\$27.79)	\$54.17
1981	\$3.30	\$16.31	\$19.61
1982	(\$9.51)	\$31.16	\$21.65
1983	(\$19.64)	\$29.16	\$9.52
1984	(\$24.40)	\$38.90	\$14.50
AVERAGE	\$6.80	\$20.88	\$27.68
STDEV	\$70.41	\$32.93	\$80.26
+STDEV	\$77.21	\$53.81	\$107.94
-STDEV	(\$63.62)	(\$12.05)	(\$52.59)

OPTION 2	COW/CALF	BACKGROUND 1.25/ADG	CUMULATIVE RET-VC
1975	(\$65.24)	(\$0.04)	(\$65.28)
1976	(\$65.74)	(\$37.81)	(\$103.55)
1977	(\$53.03)	\$66.31	\$13.28
1978	\$81.55	\$117.84	\$199.39
1979	\$138.73	(\$122.77)	\$15.96
1980	\$81.96	(\$108.15)	(\$26.19)
1981	\$3.30	(\$19.15)	(\$15.85)
1982	(\$9.51)	(\$17.25)	(\$26.76)
1983	(\$19.64)	(\$41.90)	(\$61.54)
1984	(\$24.40)	(\$54.23)	(\$78.63)
AVERAGE	\$6.80	(\$21.72)	(\$14.92)
STDEV	\$70.41	\$72.36	\$84.70
+STDEV	\$77.21	\$50.65	\$69.78
-STDEV	(\$63.62)	(\$94.08)	(\$99.62)

OPTION 1 Calf born MAR 1 and weaned NOV 1 @ 550 lbs.  
Backgrounded @ 2.25 ADG until JAN 28

OPTION 2 Calf born MAR 1 and weaned NOV 1 @ 550 lbs.  
Backgrounded @ 1.25 ADG until APR 10

TABLE 39.--Apr-May retained ownership; cumulative  
returns-variable costs @ 750 lbs

OPTION 1	COW/CALF	BACKGROUND 2.25/ADG	CUMULATIVE RET-VC
1975	(\$94.20)	\$56.02	(\$38.18)
1976	(\$85.78)	\$16.33	(\$69.45)
1977	(\$75.56)	\$120.68	\$45.12
1978	\$38.32	\$210.44	\$248.76
1979	\$80.93	(\$0.43)	\$80.50
1980	\$27.65	\$3.31	\$30.96
1981	(\$39.56)	\$76.41	\$36.85
1982	(\$53.34)	\$84.43	\$31.09
1983	(\$59.09)	\$65.20	\$6.11
1984	(\$65.73)	\$57.68	(\$8.05)
AVERAGE	(\$32.64)	\$69.01	\$36.37
STDEV	\$59.90	\$62.53	\$86.18
+STDEV	\$27.27	\$131.54	\$122.55
-STDEV	(\$92.54)	\$6.48	(\$49.80)

OPTION 2	COW/CALF	BACKGROUND 1.25/ADG	FULL GRAZE 1.45/ADG	CUMULATIVE RET-VC
1975	(\$94.20)	\$29.37	\$26.09	(\$38.74)
1976	(\$85.78)	(\$10.35)	(\$31.10)	(\$127.23)
1977	(\$75.56)	\$77.31	(\$17.92)	(\$16.17)
1978	\$38.32	\$156.97	\$15.83	\$211.12
1979	\$80.93	(\$69.46)	(\$67.90)	(\$56.43)
1980	\$27.65	(\$66.03)	\$31.91	(\$6.47)
1981	(\$39.56)	(\$3.13)	(\$9.85)	(\$52.54)
1982	(\$53.34)	(\$1.77)	\$2.06	(\$53.05)
1983	(\$59.09)	(\$20.43)	(\$33.12)	(\$112.64)
1984	(\$65.73)	(\$30.04)	(\$17.83)	(\$113.60)
AVERAGE	(\$32.64)	\$6.24	(\$10.18)	(\$36.58)
STDEV	\$59.90	\$68.08	\$30.42	\$96.34
+STDEV	\$27.27	\$74.32	\$20.24	\$59.77
-STDEV	(\$92.54)	(\$61.84)	(\$40.60)	(\$132.92)

OPTION 1 Calf born MAY 1 and weaned NOV 1 @ 403 lbs.  
Backgrounded @ 2.25 ADG until APR 3

OPTION 2 Calf born MAY 1 and weaned NOV 1 @ 403 lbs.  
Backgrounded @ 2.25 ADG until APR 25  
Grazed @ 1.45 ADG full season (2 ADG early) until JUL 3

TABLE 39.—Continued. Apr-May retained ownership; cumulative returns-variable costs @ 750 lbs

=====				
OPTION 3	BACKGROUND		INTENSIVE	CUMULATIVE RET-VC
	COW/CALF	1.25/ADG	GRAZE 2.0/ADG	
-----				
1975	(\$94.20)	\$29.37	\$42.96	(\$21.87)
1976	(\$85.78)	(\$10.35)	(\$13.04)	(\$109.17)
1977	(\$75.56)	\$77.31	(\$0.32)	\$1.43
1978	\$38.32	\$156.97	\$34.24	\$229.53
1979	\$80.93	(\$69.46)	(\$46.61)	(\$35.14)
1980	\$27.65	(\$66.03)	\$52.49	\$14.11
1981	(\$39.56)	(\$3.13)	\$10.32	(\$32.37)
1982	(\$53.34)	(\$1.77)	\$22.04	(\$33.07)
1983	(\$59.09)	(\$20.43)	(\$12.67)	(\$92.19)
1984	(\$65.73)	(\$30.04)	\$2.93	(\$92.84)
AVERAGE	(\$32.64)	\$6.24	\$9.23	(\$17.16)
STDEV	\$59.90	\$68.08	\$29.86	\$95.94
+STDEV	\$27.27	\$74.32	\$39.09	\$78.78
-STDEV	(\$92.54)	(\$61.84)	(\$20.63)	(\$113.09)
=====				

OPTION 3 Calf born MAY 1 and weaned NOV 1 @ 403 lbs.  
 Backgrounded @ 2.25 ADG until APR 25  
 Grazed @ 2.0 ADG intensive until JUL 3

TABLE 40.--Sep-Oct retained ownership; cumulative  
returns-variable costs @ 750 lbs

OPTION 1	BACKGROUND		CUMULATIVE RET-VC
	COW/CALF	2.25/ADG	
1975	(\$89.78)	\$21.42	(\$68.36)
1976	(\$64.23)	(\$33.74)	(\$97.97)
1977	(\$71.15)	\$1.20	(\$69.95)
1978	\$40.34	\$45.00	\$85.34
1979	\$144.73	\$10.81	\$155.54
1980	\$54.83	\$17.50	\$72.33
1981	\$5.24	\$7.80	\$13.04
1982	(\$17.76)	\$16.48	(\$1.28)
1983	(\$16.17)	(\$44.45)	(\$60.62)
1984	(\$47.50)	(\$2.23)	(\$49.73)
AVERAGE	(\$6.15)	\$3.98	(\$2.17)
STDEV	\$70.96	\$26.25	\$83.10
+STDEV	\$64.81	\$30.23	\$80.93
-STDEV	(\$77.10)	(\$22.27)	(\$85.26)

OPTION 2	INTENSIVE		BACKGROUND	CUMULATIVE RET-VC
	COW/CALF	GRAZE 1.75/ADG	2.25/ADG	
1975	(\$126.10)	\$16.61	\$35.45	(\$74.04)
1976	(\$70.10)	(\$12.18)	(\$42.53)	(\$124.81)
1977	(\$90.81)	\$6.97	(\$4.73)	(\$88.57)
1978	(\$6.70)	\$62.58	\$22.57	\$78.45
1979	\$144.17	(\$13.65)	(\$15.46)	\$115.06
1980	\$5.78	\$20.85	\$11.70	\$38.33
1981	(\$31.84)	\$2.48	\$16.14	(\$13.22)
1982	(\$54.41)	\$19.51	\$7.04	(\$27.86)
1983	(\$37.78)	(\$14.03)	(\$37.86)	(\$89.67)
1984	(\$78.85)	\$17.32	(\$4.19)	(\$65.72)
AVERAGE	(\$34.66)	\$10.65	(\$1.19)	(\$25.21)
STDEV	\$74.18	\$23.00	\$25.21	\$79.39
+STDEV	\$39.52	\$33.64	\$24.02	\$54.18
-STDEV	(\$108.85)	(\$12.35)	(\$26.40)	(\$104.59)

OPTION 1 Calf born OCT 1 and weaned JUL 1 @ 578 lbs.  
Backgrounded @ 2.25 ADG until SEP 15

OPTION 2 Calf born OCT 1 and weaned MAY 1 @ 464 lbs.  
Grazed @ 1.75 ADG Intensive until JUL 15  
Backgrounded @ 2.25 ADG until SEP 23

TABLE 40.--Continued.Sep-Oct retained ownership; cumulative returns-variable costs @ 655 lbs

=====		
OPTION 3		
	FULL GRAZE 1.27/ADG	CUMULATIVE RET-VC
COW/CALF		
-----		
1975 (\$126.10)	\$45.92	(\$80.18)
1976 (\$70.10)	(\$46.78)	(\$116.88)
1977 (\$90.81)	(\$0.35)	(\$91.16)
1978 (\$6.70)	\$71.31	\$64.61
1979 \$144.17	(\$38.85)	\$105.32
1980 \$5.78	\$28.12	\$33.90
1981 (\$31.84)	\$6.13	(\$25.71)
1982 (\$54.41)	\$7.45	(\$46.96)
1983 (\$37.78)	(\$42.88)	(\$80.66)
1984 (\$78.85)	\$14.48	(\$64.37)
AVERAGE (\$34.66)	\$4.46	(\$30.21)
STDEV \$74.18	\$38.91	\$73.94
+STDEV \$39.52	\$43.36	\$43.73
-STDEV (\$108.85)	(\$34.45)	(\$104.15)
-----		

OPTION 3 Calf born OCT 1 and weaned MAY 1 @ 464 lbs.

Grazed @ 1.27 ADG Full season until OCT 1 (655 LBS)



TABLE 41.--Nov-Dec retained ownership; cumulative  
returns-variable costs @ 750 lbs

=====		
OPTION 1	BACKGROUND	CUMULATIVE
COW/CALF	2.25/ADG	RET-VC
-----		
1975 (\$117.81)	\$43.56	(\$74.25)
1976 (\$86.01)	(\$22.69)	(\$108.70)
1977 (\$88.75)	\$5.50	(\$83.25)
1978 \$23.83	\$43.77	\$67.60
1979 \$111.97	\$8.62	\$120.59
1980 \$8.98	\$43.99	\$52.97
1981 (\$34.94)	\$15.78	(\$19.16)
1982 (\$48.41)	\$17.73	(\$30.68)
1983 (\$55.23)	\$0.26	(\$54.97)
1984 (\$84.91)	\$30.70	(\$54.21)
AVERAGE (\$37.13)	\$18.72	(\$18.41)
STDEV \$68.62	\$22.03	\$74.58
+STDEV \$31.49	\$40.75	\$56.17
-STDEV (\$105.75)	(\$3.31)	(\$92.98)
-----		
OPTION 2	BACKGROUND	CUMULATIVE
COW/CALF	2.25/ADG	RET-VC
-----		
1975 (\$93.32)	\$33.17	(\$60.15)
1976 (\$74.26)	(\$24.22)	(\$98.48)
1977 (\$65.18)	(\$10.68)	(\$75.86)
1978 \$56.48	\$33.43	\$89.91
1979 \$138.79	(\$4.24)	\$134.55
1980 \$69.69	(\$15.88)	\$53.81
1981 (\$1.94)	(\$5.53)	(\$7.47)
1982 (\$10.62)	(\$14.21)	(\$24.83)
1983 (\$57.57)	\$28.25	(\$29.32)
1984 (\$57.65)	\$26.34	(\$31.31)
AVERAGE (\$9.56)	\$4.64	(\$4.92)
STDEV \$75.73	\$22.85	\$74.85
+STDEV \$66.18	\$27.49	\$69.94
-STDEV (\$85.29)	(\$18.20)	(\$79.77)
-----		

OPTION 1 Calf born DEC 1 and weaned JUL 15 @ 481 lbs.  
Background @ 2.25 ADG until NOV 13

OPTION 2 Calf born DEC 1 and weaned SEP 1 @ 546 lbs.  
Background @ 2.25 ADG until DEC 1

TABLE 42.--Feb-Mar and Apr-May retained ownership; cumulative returns-variable costs (November-April)

FEB-MAR	COW/CALF	BACKGROUND 2.25/ADG	CUMULATIVE RET-VC
1975	(\$65.24)	\$54.13	(\$11.11)
1976	(\$65.74)	\$22.60	(\$43.14)
1977	(\$53.03)	\$132.22	\$79.19
1978	\$81.55	\$226.10	\$307.65
1979	\$138.73	(\$48.25)	\$90.48
1980	\$81.96	(\$37.46)	\$44.50
1981	\$3.30	\$69.02	\$72.32
1982	(\$9.51)	\$54.63	\$45.12
1983	(\$19.64)	\$24.97	\$5.33
1984	(\$24.40)	(\$13.23)	(\$37.63)
AVERAGE	\$6.80	\$48.47	\$55.27
STDEV	\$70.41	\$82.21	\$100.68
+STDEV	\$77.21	\$130.68	\$155.95
-STDEV	(\$63.62)	(\$33.74)	(\$45.41)
APR-MAY	COW/CALF	BACKGROUND 2.25/ADG	CUMULATIVE RET-VC
1975	(\$94.20)	\$85.95	(\$8.35)
1976	(\$85.78)	\$46.36	(\$39.42)
1977	(\$75.56)	\$147.92	\$72.36
1978	\$38.32	\$256.26	\$294.58
1979	\$80.93	\$8.82	\$89.75
1980	\$27.65	\$20.37	\$48.02
1981	(\$39.56)	\$92.25	\$52.69
1982	(\$53.34)	\$83.41	\$30.07
1983	(\$59.09)	\$57.21	(\$1.88)
1984	(\$65.73)	\$44.63	(\$21.10)
AVERAGE	(\$32.64)	\$84.31	\$51.67
STDEV	\$59.90	\$72.43	\$95.12
+STDEV	\$27.27	\$156.74	\$146.79
-STDEV	(\$92.54)	\$11.88	(\$43.45)

FEB-MAR Calf born MAR 1 and weaned NOV 1 @ 550 lbs.  
Backgrounded @ 2.25 ADG until APR 25

APR-MAY Calf born MAY 1 and weaned NOV 1 @ 403 lbs.  
Backgrounded @ 2.25 ADG until APR 25

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AN ANALYSIS OF CALVING SEASON  
STRATEGIES

by

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AN ABSTRACT OF A MASTER'S THESIS

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The purpose of this thesis was to evaluate the impacts of calving season on cowherd profitability. The budgeting technique was the primary analytical tool used in this study with eight different management options being analyzed. Cow feed costs and calf prices were the major variables. All other factors of production that were not directly affected by calving season were held constant or in constant proportion throughout the analysis. By analyzing these key variables, significant relationships were sought that could aid producers and ag specialists concerning the calving season decision and analyzing individual cow-calf operations.

The completed budgets revealed low average returns coupled with high year to year variability in its analysis of cowherd profitability. These results, combined with the high capital investment necessary and low rates of return to cowherd ownership, imply that there are both financial and risk barriers to entry in the cattle business.

Early spring calving was the most profitable calving period in this analysis. Feb-Mar was the only calving season to average positive returns over its variable costs while no calving season could cover its total costs of production.

The results indicated that spring calving cowherds, by better matching cow needs with range nutritional value, had lower feed costs than fall calving herds. Early spring feed costs averaged 11-16% lower than the fall periods while feed costs for the late spring period (Apr-May) averaged 21-26% lower. The Feb-Mar horn calves, being heavier at sale time, utilized the



lower feed costs to earn positive returns to variable costs, while the 130 lbs lighter Apr-May calves lost an average of \$32.64.

It was found that, in fall calving herds, calf size again played an important role. The more profitable management strategies were those weaning the larger nine month old calves as opposed to the lighter seven month old calves. In addition, fall calving cowherd returns were found to be significantly improved with the implementation of a supplemental fescue option. In the case of Sep-Oct calving, supplemental fescue pasture lowered cow feed costs an average of \$20.26 and increased average returns over variable costs \$21.60, from (\$6.15) to \$15.45.

Because cowherd profits are affected by both costs and revenue, the ratio of cow unit feed costs over total revenue was evaluated. This measure showed that long run profitability would be difficult unless cow unit feed costs were forty percent or less of total cow unit revenue.

Cattle prices were found to be the critical factor in determining overall cowherd profitability, with positive returns for any calving season being dependent upon above average prices. In this analysis it was found that, although cattle prices are strongly influenced by seasonal trends and premiums between weight classifications, these price differentials had less influence on profitability than factors such as cow feed costs and calf weights. This finding implies that producers should concentrate not on matching calving season strategies with seasonal highs in prices, but on organizing a complete marketing plan for the cattle they produce.

Retained ownership was the final section of this study. Comparisons of the various calving season management strategies suggested that, although retained ownership can often improve overall profitability, only the spring calving seasons were improved enough to significantly cover their overall variable costs. This resulted from the spring born calves being able to take advantage of the seasonally higher prices which occur after a typical overwintering program. In addition, because of the higher returns and lower capital requirements, backgrounding operations may represent one of the few ways that young and highly leveraged operators can survive in the beef cattle industry.